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WHY ENVIRONMENTAL EDUCATION?

Within the past fifty years, the United States has become a predominantly urban nation, both in thought and in physical character. Large and middle-sized communities, many within complex urban regions, have evolved to where over seventy per cent of this country's population resides on one and one-half per cent of the nation's land surface. By 1980, eight out of ten Americans will probably live in an urban environment. Consequently, the independent rural-oriented living that once characterized this country's social and political heritage is no longer a dominating influence in the lives of most Americans.

In rural surroundings, direct daily contact with the basic natural resources was prevalent, especially within man's immediate environment. As man became progressively urbanized, his intimate association and interaction with natural resources diminished and, with it his awareness of his dependency on them. Yet, it is imperative that man, wherever he lives, comprehend that his welfare is dependent upon the "proper" management and use of these resources.

Man should also have an awareness and understanding of his community and its associated problems. Our communities are being plagued with problems such as: lack of comprehensive environmental planning; indiscriminate use of pesticides; community blight; air and water pollution; traffic congestion; and the lack of institutional arrangements needed to cope effectively with environmental problems. While these problems are legitimate concerns of community governmental officials and planners, the responsibility for their solution rests, to a large extent, with citizens.

To an increasing extent citizens are being asked to make decisions that affect (directly and indirectly) their environment. Specifically, citizens make these decisions as they cast votes on community issues; as they elect representatives to policy-making bodies; as they directly act upon the environment itself. Citizens can be effective in influencing sound policy in other ways. They can ask informed questions, at the proper time, of the right people. They can serve on advisory and policy-making committees. They can support sound legislation directed at resolving environmental problems. To perform these tasks effectively, it is vital that the citizenry be knowledgeable concerning their biophysical environment and associated problems, aware of how they can help solve these problems, and motivated to work toward effective solutions.

Most current programs in conservation education are oriented primarily to basic resources; they do not focus on the community environment and its associated problems. Furthermore, few programs emphasize the role of the citizen in working, both individually and collectively, toward the solution of problems that affect our well being. There is a

NAL Bldg
10301 Baltimore Blvd
Beltsville, MD 20705-2351

vital need for an educational approach that effectively educates man regarding his relationship to the total environment.

The Supreme Court decision regarding the one-man, one-vote concept, that has enabled the increasing urban majority to acquire greater powers in decision-making, makes it imperative that programs developed for urbanites be *designed with them in mind*. It is important to assist each individual, whether urbanite or ruralite, to obtain a fuller understanding of the environment, problems that confront it, the interrelationship between the community and surrounding land, and opportunities for the individual to be effective in working toward the solution of environmental problems.

This new approach, designed to reach citizens of all ages, is called "environmental education." We define it in this way.

Environmental education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution.

The major objectives of environmental education are to help individuals acquire:

1. A clear understanding that man is an inseparable part of a system, consisting of *man, culture, and the biophysical environment*, and that man has the ability to alter the interrelationships of this system.

The principal feature of the philosophy of environmental education is that man is an integral part of a system from which he cannot be separated. Specifically, this system consists of three components, man, culture, and the biophysical environment. *Culture*, in this context, incorporates organizational strategies, technological processes, and social arrangements (political, legal, managerial, educational, etc.) through which man interacts with the biophysical environment. The *biophysical environment* designates both the natural and man-made components of the environment.

The fundamental relationship between the integral parts of the system is man's interaction through culture on the biophysical environment to produce or obtain the goods and services that he needs.

Within the system, man has the ability either to strengthen, weaken, or maintain the in-

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terrelationships between the system's major components. The ultimate goal of environmental education is the development and maintenance of a high quality system in which man interacts through culture on the biophysical environment to advance human welfare.

2. A broad understanding of the biophysical environment, both natural and man-made, and its role in contemporary society.

The existence of any civilization is dependent upon man's use of natural resources. Resources are defined as those parts of the biophysical environment which are appraised by man as being immediately or potentially useful to him.

A basic understanding of natural resources ideally includes their characteristics, distribution, status, interrelationships, and their present and potential uses. Natural resources serve man in many ways, whether in a relatively undisturbed condition or in the highly altered utilitarian forms of the man-made biophysical environment. A strong understanding of how these resources are used requires knowledge of the social, political, economic, technological processes, institutional arrangements, and aesthetic considerations which govern their utilization.

The man-made component of the biophysical environment results from man's use of natural resources. An understanding of this aspect is also essential: it should ideally include familiarity with urban and rural design, including transportation systems, spatial patterns of development, and aesthetic qualities which have a major impact on the functioning of society. Fundamental to these understandings should be the realization that the development of the man-made environment should strive for a high quality system which improves human welfare in relation to the natural environment.

**The University of Michigan
School of Natural Resources**

3. A fundamental understanding of the *biophysical environmental problems* confronting man, how these problems can be solved, and the *responsibility* of citizens and government to work toward their solution.

Biophysical environmental problems result from the interactions between man, culture and the biophysical environment. Pollution, the inefficient utilization and management of natural resources, the indiscriminate use of pesticides, urban blight, and transportation congestion are just a few biophysical environmental problems. These problems, caused by a complex set of biological, physical and social factors, affect the total environmental system.

Citizens need to understand *how* to work toward solutions of biophysical environmental problems through laws, public policies, planning, resource management, research, technological developments, and institutional arrangements.

Citizens should realize that the *responsibility* for solutions to these problems belongs to them and the governments which represent them.

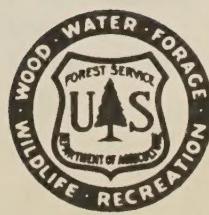
4. Attitudes of concern for the quality of the biophysical environment which will motivate citizens to participate in biophysical environmental problem-solving.

The word "attitude" used in this context implies more than simply the knowledge of a body of factual information.

Instead, it implies a combination of factual knowledge and motivating emotional concern which result in a tendency to act. Further, it is understood that clusters of attitudes about similar environmental conditions will motivate individuals to express their attitudes.

Therefore, for environmental education to achieve its greatest impact, it must: (1) provide factual information which will lead to an understanding of the total biophysical environment; (2) develop a concern for environmental quality which will motivate citizens to work toward solutions to biophysical environmental problems; and (3) inform citizens as to how they can play an effective role in achieving the goals derived from their attitudes.

Investigating Your Environment



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INVESTIGATING YOUR ENVIRONMENT

INTRODUCTION

The environmental investigations in this series are designed to help you take an in-depth look at different component parts of your environment. The investigations were developed after several years of field-testing with teachers, resource people, and students for use in environmental education training courses for teachers and resource people.

The lesson plans provide a structure to learning in that one activity builds on others and leads to some concluding environmental interactions. It also provides freedom within the structure for the student to observe, collect, and record meaningful information at his own pace through the use of the self-directed task cards. This changes the role of the teacher from that of a dispenser of facts and information to that of a facilitator, motivator, and learner along with the student.

You will notice that in most cases charts and tables are provided for the student to interpret his own information on data collected.

These lessons also provide for a maximum of student response and summary because of the discussion and questions sections.

The processes used in these lessons can be replicated and are transferable in any environment. (Collecting observable data, making inferences, setting up investigations to check out inferences, communicating feelings and awareness.)

The activities used are not replicable in all environments. You will have to develop activities appropriate to the environment in which you are investigating.

The authors of these lesson plans felt it was important to include the following elements:

Processes

The processes of both data collecting and group problem solving are the first step toward understanding important generalization and big ideas about the environment.

Self-Directed Task Cards

Self-directed task cards are used to accomplish certain activities without the aid of the instructor. Some could be removed from the rest of the lesson plan and used as isolated activities for shorter periods of time.

Discussion Questions

Discussion questions are used as introduction to activities or as summary follow-up to activities. (This minimizes instructor explanations and involves the participants in contributing their thoughts and information.)

Analyzing Charts and Tables

These are provided so student can interpret his own data collected and check out his inferences made during the investigations.

Summarizing Questions

The summary questions used at the end of certain tasks and at the end of the session are one of the most exciting and important parts of each lesson. These questions are designed to:

1. ALLOW PARTICIPANTS TO DISCUSS THE IMPLICATIONS OF WHAT THEY LEARNED TO THE MANAGEMENT OF THE ENVIRONMENT.
2. ALLOW PARTICIPANTS TO GENERATE THEIR OWN CONCEPTS AND GENERALIZATIONS ABOUT WHAT THEY HAVE DONE.

Behavioral Outcomes

The behavioral outcomes for each lesson indicate some minimal expectations in acquiring new knowledge and skills and indicate the nature of expected outcomes in feelings, awareness, values, and action about the environment.

IMPLEMENTING THE INVESTIGATIONS

The guidelines listed below are designed to help you involve people in environmental investigations. They are in no way "sure fire." You may have to change some of them to adapt to your situation and you may want to add to or delete from the list.

Make sure you have all your materials and equipment ready and that you have visited the necessary parts of the environment you will use in your investigations. Is there sufficient amount of equipment and is it all in working order? How are you going to check it out and make sure you get it all back (see guideline 4)?

Before you leave for the study area with your group have you discussed possible hazards with them and the "rules of the road"?

Some guidelines:

1. Go over quickly with your students what will take place during your session so they will know what to expect.
2. Use the lesson plan outline as a guide involving questioning strategies and self-directed investigations. Revise as necessary to fit your situation.
3. Minimize teacher talk and/or lecture (refer to and use question and discussion sections of outline - these work in eliciting responses).
4. Plan and pace your session so that what you do is done thoroughly and well. For example, it is okay to give them some data to solve a problem, instead of letting the class gather it, if time is a problem. Don't have your lesson so rushed that you have to give out data all the time. If you have a time restriction, make sure you decide ahead of time which TASKS you are going to eliminate.

5. The summarizing question and discussion area of how this relates to man and the management of the environment is so important that you should plan to start the summarizing and discussion area of the session at least 1/2 hour before dismissal.
6. Conclude the session with the summarizing questions or equivalent at the end of the lesson plan. (This is one of the most important parts of the activity.) This will give you an evaluation tool to see what generalizations or concepts students can generate.
7. Have class discuss and list in small groups ways in which the study activities can help change attitudes. Groups may share ideas.
8. Assign one or two students to be accountable for equipment at the beginning of each session. (Have the same people be responsible for cleaning up the equipment at the end of each session.)
9. Be thinking of ways your lesson can be integrated into the curriculum when you return to the classroom. What kind and how much follow up are you going to do?
10. When your session is finished, jot down strengths and weaknesses so you can revise your lesson so it will be better next time.

The authors also feel the ideas written here will suggest new ways of using your environment for learning, and that the activities and ideas will never really come to life until you have modified and changed them to fit your own needs. So if you use the lesson plans exactly as they are written here, you will be using them incorrectly.

As in any important learning experience, the instructor should go through the lesson plan and the environment in which the activity will take place before introducing it to the students.

and the 1960's and had to make significant political gains before all of his demands were met. In addition to the improvements made by the Black Caucus, the Black Congress also played a role in helping to bring about the changes in the Black Caucus.

In addition to the Black Caucus, other Black leaders and organizations also played a role in the struggle for civil rights. One such organization was the National Association for the Advancement of Colored People (NAACP). The NAACP worked to combat discrimination and racism through legal challenges and advocacy.

The Civil Rights Movement was a complex and multifaceted struggle that involved many different groups and organizations. The struggle for civil rights was not just a political effort; it was also a social and cultural movement that sought to change the way people thought and acted. The Civil Rights Movement was a powerful force that helped to bring about significant changes in American society.

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DATA COLLECTING GUIDELINES FOR ENVIRONMENTAL PROBLEM SOLVING

DEFINING THE PROBLEM

What problem or issue is involved?

What are some factors that contribute to the problem or issue?

What do you want to find out about this problem and/or its factors?

DATA COLLECTING AND RECORDING

What kind of data needs to be collected?

Which places are available for data collecting?

What methods and materials are available for collecting this data? (visual observation, testing equipment for biophysical data, past records, etc.)

Which methods and materials would be most appropriate for your investigation?

How can this data be recorded in a manner that will provide for significant interpretations? (tables, charts, graphs, written observations, maps, sketches, etc.)

What additional information may be needed to help interpret the data you collect?

Construct a data recording instrument in the space below:

DATA INTERPRETING

What does the collected data tell you about the problem or issue involved?

What comparisons, contrasts, or cause-and-effect relationships can be inferred from the collected data?

What big ideas are suggested by the interpretation of this data?

What implications do these big ideas have to environmental management?

EXTENDING THE INVESTIGATION

Which parts of the investigation can be explored more fully by further data collecting?

What further data needs to be collected? (where? how often? time of year?)

What might be significant about collecting the additional information?

FACTOR HOW IT CONTRIBUTES
 TO THE PROBLEM

ALTERNATIVES TO ITS PRESENT CONDITION
Select one or more alternatives below
and describe how the factor might be
changed

(Elimination Modification Substitution)

DESCRIBE HOW THE CHANGE
WILL AFFECT THE PROBLEM

Which alternative or combination of alternatives might bring about an improvement or solution of the problem?
Give reasons for your choices.

ACTION PLANNING FOR PROBLEM SOLUTION

SUGGESTED ALTERNATIVE SOLUTION	TYPE ACTION NECESSARY TO ALTER CONDITION	CHANGE AGENTS	IMPLEMENTATION STEPS TO PROBLEM SOLUTION	EVALUATION METHODS
Technological	Individual			
Social	Group			
Political	Governmental			

Summary questions:

1. What did you find out?
2. How will the selected solutions contribute to the improvement of the environment?
3. What can we say, in general, about environmental management?

LESSON PLAN OUTLINE FOR INVESTIGATING ENVIRONMENTAL HABITATS

Set the stage for this investigation by reviewing quickly what will take place in the allotted time. For example: In the next four hours we will investigate several environmental habitats; infer how animals fit into food chains and energy cycle, and how they are important to the environment; record changes in habitats and discuss what we can do as citizens to improve the biological interactions in our environment. (You might want to read the behavioral objectives at end of lesson and refer back to them as an evaluation of session.

I. OBSERVING AND MEASURING ANIMAL SIGHTING AND EVIDENCES

Questions and Discussion (10 minutes)

1. What animals would we expect to find living in this area? (vertebrate, invertebrate)
2. What are the needs of these animals?
3. What are some names of the places where animals live?
4. Where would you look for animals around here?
5. Describe and pass out TASK A and B cards.

Task A (30 minutes) Work in small groups.

1. Explore as many places (environments or habitats) as you can from _____ to _____, and record animals that you see or any evidence of animals. As you inventory the animals or their evidences, figure out some way of recording amounts of evidences and animals seen.
2. Look for and list evidence (signs) of animals (partly consumed foods, excrement, homes, bird nests, feather, etc.)
3. Observe and list different habitats for wildlife in area. (Grass, cultivated field, hedges, swamp, etc.)
4. Observe and list animal foods in area:



HABITAT INVENTORY AND COMPARISON

Task B (30 minutes) Work in small groups.

Select three different habitats and compare the numbers of animal organisms and the characteristics in each.

Habitat I

Habitat II

Habitat III

Characteristics
of Habitat I

Characteristics
of Habitat II

Characteristics
of Habitat III

Questions and Discussion

1. What animals did you find in each habitat?
2. Which habitat had the most animals? Why?
3. What were the characteristics of each habitat?
4. What could account for the differences and similarities of the habitats?
5. What factors made one habitat more desirable than another?
6. Pass out Task C.

Task C (15 minutes)

Build a food pyramid showing the comparative amounts of animal and animal evidences seen.

Questions and Discussion (15 minutes)

1. What did you find?
2. How many habitats did you investigate?
3. Which animals around here have the largest habitat, the smallest?
4. What was the largest group of animals found?
5. What do you think their main function in the environment might be?

Discuss terminology and definitions of herbivores, carnivores, omnivores, decomposers.

Task D (10 minutes)

List the animals you have seen or their evidences in the appropriate places in this diagram. Put in arrows. What other words and ways can you think of to illustrate a similar cycle?

Light
VV

Nutrients

Decomposers
(bacteria-fungus)

—
—
—
—

Death

Plants

—
—
—

Herbivores (plant eaters)

—
—
—
—

Carnivores (meat eaters)

—
—
—
—

What would happen if one group were eliminated?

If _____ group was eliminated, I think the following would happen:

Questions and Discussion (5 minutes)

1. What is the function of each part of the energy cycle?
2. What would happen if the decomposers were removed from this ecosystem?
3. How does the energy cycle relate to a food chain?
4. What is a food chain? (Who eats who?)

Pass out Task E.

Task E (10 minutes)

Construct a 5-stage food chain using specific animals seen so far.

II. OBSERVING AND RECORDING CHANGES IN ANIMAL HABITATS

Questions and Discussion (10 minutes)

1. How did your food chain relate to the energy cycle in Task D?
2. What is difference between food chain and food web?
3. Look at your food chain and see if you can construct a web out of it.
4. What evidences of influences can you name that have affected this environment?

Pass out Task F.

Task F (20 minutes)

Describe in writing, 3 influences that you observed that have changed the habitats in this area, and the cause and effect relationships that occurred.

Consider:

- a. Evidence of change, influence that made it.
- b. What area probably looked like before change occurred and animals that lived then.
- c. What area looks like now and animals that live here.
- d. How the change affected the habitat and animal species that did and do live there.

Questions and Discussion (10 minutes)

1. Have individuals read their descriptions, and compare different descriptions.
2. What evidences did you find that show man's influence in this area?

III. COMMUNICATING FEELINGS, AWARENESS, & VALUES ABOUT THE ENVIRONMENT

Task G (10 minutes)

Describe how you feel about man's effect on one animal habitat you observed.

Questions and Discussion

1. Discuss results of #G with group.
2. What are some things that man has done to effect the efficiency of the energy cycle?

Task H (15 minutes)

Describe in writing 3 things you can do in your everyday life to make the energy cycle more efficient and cause the least amount of harm to the ecosystem.

Select the one you think would be your best contribution. Describe the benefits of this action--

- a. Where you live--
- b. In your consumer habits--

Discuss Results of Task H.

Summary Questions

1. What did we find out about animals in our field study session today?
2. Why are animals important in the ecosystem?
3. How can we summarize our investigations today?
4. What processes and methods did we use to find these things out?
5. Which of the behavioral outcomes did we accomplish in this session?
(Read and discuss)

Task I

Describe in writing how you feel about our session today.

BEHAVIORAL OUTCOMES IN KNOWLEDGE

Identify and describe 6 different animal habitats.

Construct a diagram of an energy cycle, using the evidences and sightings of animal life observed at the site.

Describe at least 4 cause-and-effect relationships of the role of the decomposers in the energy cycle.

BEHAVIORAL OUTCOMES IN FEELINGS, AWARENESS, VALUES, AND ACTION

Describe how you feel about man's effect on one animal habitat observed at the site.

Describe 3 things you can do in your everyday life to make the energy cycle more efficient, and cause the least amount of harm to the ecosystem where you live and in your consumer habitats.

This lesson plan was developed for use in teacher workshops by:

Pete Hinds, Milwaukie, Oregon
Ernie McDonald, Portland, Oregon
Russ Hupe, Olympia, Washington

The lesson plan was revised in November 1971. It is suggested by the writers that continuous revision take place by people who use the ideas.

A LESSON PLAN OUTLINE FOR MEASURING SOME WATER QUALITY CRITERIA

Set the stage for this investigation by reviewing quickly what will take place in the allotted time. For example: In the next four hours we will investigate evidences of aquatic life in this stream, infer stream temperature, O₂ and pH from that life, and then check out our inferences through experimentation. We'll determine the streamflow of the stream and discuss ecological, social, and political concerns of using such water. (You might want to read the behavioral objectives at end of lesson and refer back to them as an evaluation of the session.)

I. DETERMINING WATERSHED BOUNDARIES

Distribute maps of the area, 1 for every person.

TASK A: (15 minutes) Work in small groups.

Find _____ Creek on the map. Find your location.

Where does the water in this stream come from?

(trace upstream to its source)

Draw lines around the boundaries of our watershed. (We're in the _____ Creek watershed.)

I. OBSERVING THE STREAM ENVIRONMENT

Assign Task B, for recording observations of the stream environment.
Walk to stream.

TASK B: (10-15 minutes) Work by yourself or in small groups.

As you approach the stream, observe and record your observations about the stream environment: (can be done visually and verbally)

plants

animals

air

rocks

water



Questions and discussion:

1. What did you notice about the stream environment?
2. What plants were growing on the gravel bar?
3. Why aren't large trees growing on the gravel bar?
4. What did you notice about the rocks?
5. Where did you see the bigger rocks? the smaller?

III. OBSERVING AQUATIC ANIMALS

Questions and discussion:

1. What did you notice about the water in the stream?
 2. What do animals need to live in water?
 3. Where would you expect to find animals in the water?
 4. What guidelines need to be developed by our group as we collect animals from the stream?
- (Discuss what to do with animals to keep for observation, what to do with rocks that are overturned, what to do with animals when the session is over)

TASK C: (30-40 minutes) Work by yourself or in groups.

Using collecting equipment (screens, jelly cups, etc.) collect as many types of aquatic animals as possible.

Put them in the white dishpans for observation by the group. (Keep the pan in a cool place)

Contact the instructor when you're finished, to receive the next task.

Note to instructor: Go from group to group to see how they're doing.

IV. IDENTIFYING AND RECORDING AQUATIC ANIMALS

TASK D: (20-30 minutes) Work by yourself or in groups.

Using the Golden Nature Guide Pond Life books and attached picture keys, generally identify the specimens you found.

List or sketch the animals you found below.

Description of where found	Type (name or sketch)	No.

Return animals to water as soon as finished.

Questions and discussion:

1. What animals did you find?
Compile a group list, (preferably on a chart). Each person should record the group list on his lab sheet.
2. Where did you find most of the specimens?
3. What similarities are there among the specimens?
4. What differences did you find?
5. What classification system could we use to classify the aquatic animals we found?
6. What other life would you expect to find in this stream?
7. Would we be likely to find the same specimens in a different aquatic environment? Why or why not?

V. PREDICTING WATER CHARACTERISTICS FROM AQUATIC ANIMALS FOUND

What were the things we said animals needed in order to live in the water?
(Review earlier discussion.)

Assign the following task:

TASK E: (15-20 minutes) Work by yourself.

Based on the aquatic animals you found, and the charts below in the Analyzing Data Section, predict the following characteristics of this stream:

I predict:

the water temperature will be _____ because _____

the air temperature will be _____ because _____

the pH number will be _____ because _____

the dissolved O₂ count will be _____ because _____

Keep these predictions for your own reference.

Analyzing Data

	pH RANGES THAT SUPPORT AQUATIC LIFE													
	MOST ACID		NEUTRAL				MOST ALKALINE							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Bacteria	1,0												13,0	
Plants	(algae, rooted, etc.)		6,5				12,0							
Carp, suckers, catfish, some insects	6,0		9,0											
Bass, crappie	6,5		8,5											
Snails, clams, mussels	7,0		9,0											
Largest variety of animals (trout, mayfly, stonefly, caddisfly)	6,5		7,5											

DISSOLVED OXYGEN REQUIREMENTS FOR NATIVE FISH AND OTHER AQUATIC LIFE

D.O. in parts per million

Cold-Water Organisms including (salmon and trout)(below 68°)

Spawning..... 7 ppm and above

Growth and well-being..... 6 ppm and above

Warm-Water Organisms (including game fish such as
bass, crappie)(above 68°)

Growth and well-being..... 5 ppm and above

TEMPERATURE RANGES (APPROXIMATE) REQUIRED FOR GROWTH OF CERTAIN ORGANISMS:

Temperature	Examples of Life	
Greater than 68°. (warm water)	Much plant life, many fish diseases. Most bass, crappie, bluegill, carp, catfish, caddis fly.	
Less than 68° (cold water)	Upper range (55-68)	Some plant life, some fish diseases. Salmon, trout, Stonefly, mayfly, caddis fly, water beetles, striders
	Lower range (Less than 55)	Trout, caddis fly, stonefly, mayfly

Questions and discussion:

1. As a group, discuss the range of predictions.
2. What criteria did you use to arrive at your predictions?
3. How can we test out our predictions?

VI. MEASURING AND RECORDING WATER CHARACTERISTICS TO TEST OUT PREDICTIONS

Directions to group:

We can test out the predictions we just made, using these kits (Hach O₂ pH Testing Kit or equivalent) (Open up kit. Mention that instructions are inside lid.)

There are lots of jobs to be done in testing (clipping, squirting, swirling, dipping, counting, reading, etc.) so make sure everyone in the group has a job to do.

Work in groups of 5-6 people each. Each group take a kit. (Send groups to different parts of the stream.)

Note to instructor: Not necessary to demonstrate the use of the kit. Let them do it. (This task could be taped somewhere on the water test kit.)

TASK F: (20-30 minutes) Work in groups of 4-6 people.
(This task could be taped somewhere on the water test kit.)

MAKE SURE EVERYONE IN YOUR GROUP GETS INVOLVED IN THE TESTING.

Using the water test kit, determine the water temperature, air temperature, dissolved oxygen count, and pH of the stream.

Record the data below: (also record predictions from Task E to compare)

Location of water sample (Edge or middle of stream)	Time Taken	Temperature		pH		Usable Oxygen (ppm)	
		Water My Pred. Test	Air My Pred. Test	Act. Test	My Pre. Test	Act. Predic.	My Actual Test

Questions and discussion:

Have each group report the results of their tests to the entire group. Compare results.

1. What might account for any differences in results from each group?
2. How did your test results compare to your predictions?
3. Is it necessary to have sophisticated equipment to determine temperature, oxygen, pH, etc.? (We could use our inferences made from the animals found in the stream.)
4. What can we say about the quality of the water in this stream?
5. What else would we need to know to decide whether or not to drink this water?
6. Under what conditions might we expect to get different test results than we did today?

VII. MEASURING STREAMFLOW (Use if investigation is being made along a stream.)

Questions and discussion:

1. What measurements do we need to know in order to determine the amount of water in this stream? (Discuss how to make different measurements.)
2. Predict how many people could live off the water in this stream.

TASK G: (45 minutes)

DETERMINATION OF STREAMFLOW

Instructions for collecting and recording streamflow measurements.

- a. Measure and mark a 100 foot distance along a straight section of your stream. If you can't find a 100' section, use 25' or 50'. Throw a stick (2 or 3 inches long) in the water above the upstream marker. Record the number of seconds it takes to float downstream between the markers. Record below. Now divide the 100 foot distance by the total seconds it took the stick to float between the stakes.

$$\frac{100 \text{ ft.}}{\text{(distance)}} = \frac{\text{ft. per second}}{\text{(number of feet stick floated)}} \\ \text{to float 100 ft.} \cdot \frac{\text{each second}}{\text{}}$$

- b. Find the average width of your section of the stream. Measure the width of the stream at 3 places within the 100 foot area. Divide the total by 3 to get the average width of the stream.
- First measurement _____ feet.
 Second measurement _____ feet.
 Third measurement _____ feet.

$$\text{Total } \frac{\text{feet}}{\text{}} + 3 = \frac{\text{ft. (average width)}}{\text{}}$$

- c. Find the average depth of your section of the stream. Measure the depth of the stream in at least 3 places across the stream in a straight line. Divide the total by 3 to get the average depth of the stream.
- First measurement _____ feet.
 Second measurement _____ feet.
 Third measurement _____ feet.

$$\text{Total } \frac{\text{feet}}{\text{}} + 3 = \frac{\text{ft. (average depth)}}{\text{}}$$

- d. Find the cubic feet of water per second. Multiply the average width, average depth and the number of feet the stick floated each second.

$$\frac{\text{ft.} \times \text{ft.} \times \text{ft.}}{\text{Average Width} \quad \text{Average Depth} \quad \text{Number of Feet per Second}} = \frac{\text{Cubic feet of water flowing per second}}{\text{}}$$

Note: A cubic foot of water is the water in a container 1 foot wide, 1 foot high and 1 foot long, and contains 7.48 gallons.
 In order to find out how many people could live from the water in this stream, complete the following calculations.

$$\frac{\text{Stream flow in Cu. ft. per sec.}}{\text{}} \times \frac{\text{Gallons in 1 cu. ft.}}{\text{}} = \frac{\text{Gallons of water per second}}{\text{}}$$

$$\frac{\text{Gallons per second}}{\text{}} \times \frac{60}{\text{Sec. in minute}} = \frac{\text{Gallons of water per minute}}{\text{}}$$

$$\frac{\text{Gal. s. f. water per min.}}{\text{}} \times \frac{1440}{\text{No. minutes in a day}} = \frac{\text{Total gallons water per day}}{\text{}} \cdot \frac{*200 \text{ Gals.}}{\text{Amount of water one person uses per day}} = \frac{\text{Total no. people who could live from water in this stream}}{\text{}}$$

*The average person uses about 200 gallons of water a day for home use. This does not reflect each persons share of water used for industrial, public services, and commercial.

Questions and discussions:

1. How many people in your community could live off the water in this stream?
2. What would happen to this environment if we piped all the water out of the stream at this point to your community?
3. If we were going to use this water, how much water should be left to flow down stream? Why?
4. Does this stream always have this amount of water in it? Why?
5. What are some problems you encountered during this task?

VIII. COMMUNICATING FEELINGS, AWARENESS, AND VALUES ABOUT WATER

Questions and discussion:

How important is this stream to us?

TASK H: (10-15 minutes) Work by yourself.

1. Describe in writing how you feel about man's effect on the aquatic environment at this site:

2. Describe at least one action you can take in your everyday life to help improve the way water is managed:
 - a) in your home: _____
 - b) in your community: _____
 - c) in your consumer habits: _____
3. Describe the benefits of each action in #2.

SUMMARY QUESTIONS

1. What did you find out about water from our investigations today?
2. Why is water important to the ecosystem?
3. How can we summarize our discussions and investigations?
4. What methods and processes did we use in our investigations today?

TASK I:

Describe in writing how you feel about our session today.

BEHAVIORAL OUTCOMES IN KNOWLEDGE

As a result of these activities, you should be able to:

Identify the boundaries of the _____ Creek watershed on the map provided.

Using the list of aquatic animals found, and the water interpretation charts provided, predict the pH, temperature, and dissolved oxygen count of the stream.

Demonstrate the ability to test out the above predictions using the water testing kit.

Measure the cubic feet of water per second flowing in the stream, and determine what size community of people could live off the water in the stream.

Describe 3 ways this stream is important to the surrounding environment.

BEHAVIORAL OUTCOMES IN FEELINGS, AWARENESS, VALUES, AND ACTION

As a result of these activities, you should be able to:

Describe in writing how you feel about man's effect on the aquatic environment at this site.

Describe at least one action you can take in your everyday life to help improve the way water is managed:

- a) in your home
- b) in your community
- c) in your consumer habits

Describe the benefits of each of the above actions.

EQUIPMENT NEEDED: (for a class of 30 people)

4 water testing kits (Hach Co. or equivalent)	30 jelly cups	30 maps of the area
4 thermometers	30 hand lenses	4 50' or 100' tapes
4 white dishpans	15 Pond Life books (Golden Nature Guides)	4 screens (optional) magic markers chart paper
30 sets of lab sheets		

This lesson plan was developed for use in teacher workshops by:

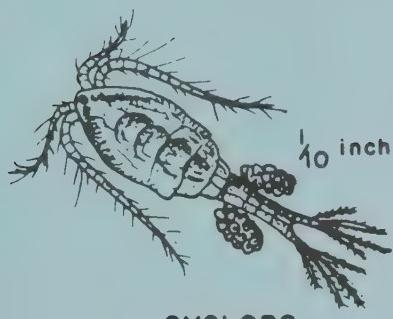
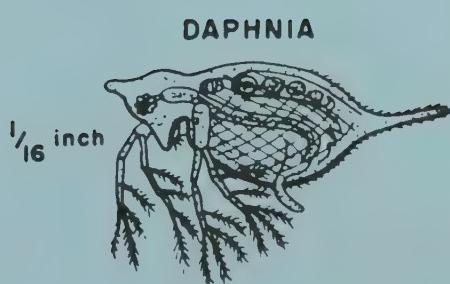
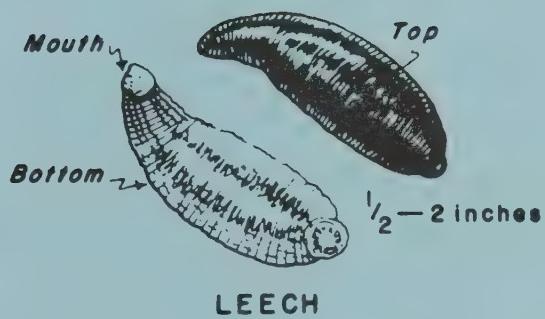
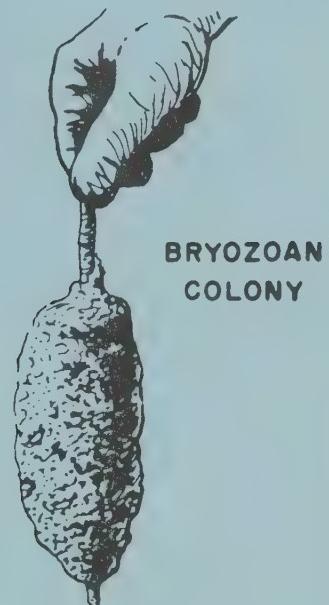
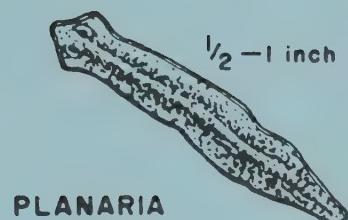
Diane Brownfield, Milwaukie, Oregon Fred Olin, Port Orchard, Washington
Jim Unterwegner, Randle, Washington Cliff Nelson, Seattle, Washington
Charline McDonald, Portland, Oregon

The lesson plan was revised in November 1971. It is suggested by the writers that continuous revision take place by people who use the ideas.

Aquatic animal drawings (pages 9-10) reprinted by permission of the Oregon State Game Commission.

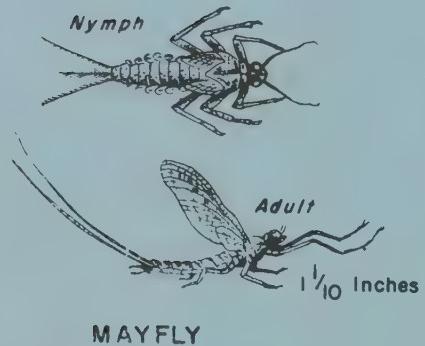


SUB-SURFACE FRESH WATER ORGANISMS

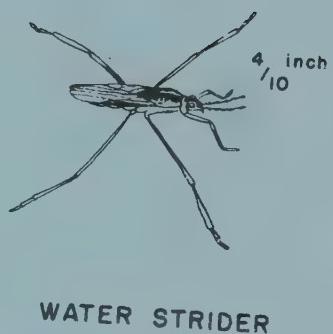
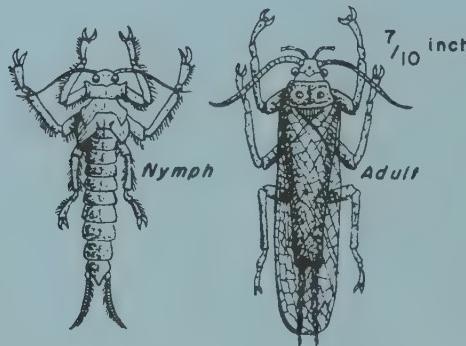




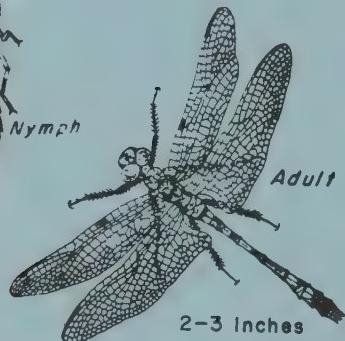
AQUATIC INSECTS



MAYFLY



WATER STRIDER

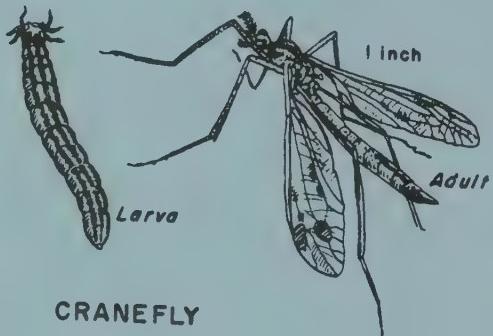


DRAGONFLY

STONEFLY



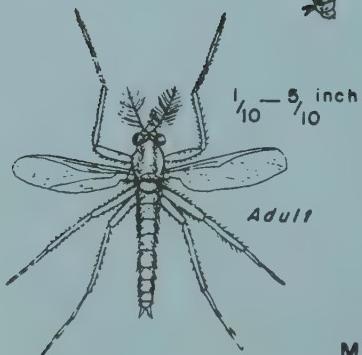
WHIRLIGIG BEETLE



CRANEFLY



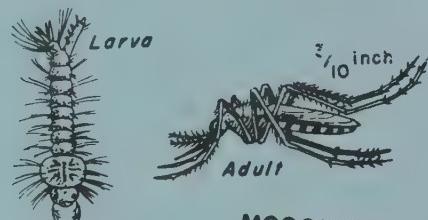
BLACK FLY



MIDGE



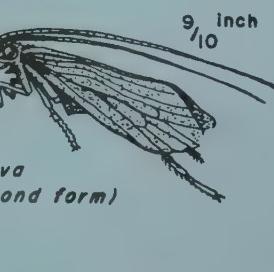
10



MOSQUITO



Larva
(stream form)



CADDISFLY

A LESSON PLAN FOR SOIL INVESTIGATIONS IN LAND USE PLANNING

set the stage for this investigation by reviewing quickly what will take place in the allotted time. For example: In the next four hours we will develop some skills and apply them to collecting and interpreting data about the soil environment and then apply that data to making some decisions about what the best uses of this land might be. (You might want to read the behavioral objectives at the end of the lesson and refer back to them as an evaluation of the session.)

I. DESCRIBING SOIL

When you first meet the group, have them sit down and do Task A:

TASK A: (5 minutes) work by yourself

Describe in writing your own description of soil.

Keep this description for your own reference at the end of the session.

II. OBSERVING AND RECORDING THINGS IN THE SOIL

Distribute Task B cards and have class work in groups of 3 or 4 and report findings in 15 minutes.

TASK B: (15 min.) work in small groups

1. Predict what things you will find in the top few inches of this forest floor. List your predictions:
2. Stake out an area 2 or 3 feet square on the forest floor and sift through the top 3 inches of the soil, recording the evidence of plant and animals you observe.

Name or Description of Item in the Soil	Quantity	Possible Effect on Soil

(continued)



TASK B - continued

3. The following three terms are used to describe organic matter at the top of the soil - litter, duff, humus. From your study above, complete the following chart:

Term and definition	Describe the feel	List the identifiable parts of plants and animals you found
Litter (identifiable dead things on surface)		
Duff (partially decomposed organic matter - compacted)		
Humus (almost completely decomposed non- identifiable organic matter)		

Questions and discussion:

1. What did you find?
2. When would you expect to find more organisms? different organisms?
3. How do the organisms you found benefit the soil?
4. What are some reasons for odors in the soil?

III. DEVELOPING THE SKILLS TO COLLECT SOIL DATA

Questions and discussion:

1. Move group around to the soil profile.
2. What can we see as we look at this crossection or profile of soil?
3. What are some things that would be important to find out about it?
(accept all comments)

The observable characteristics of color, texture, structure, temperature and the acidity or alkalinity (pH) of a soil are indications of some soil conditions important in land use planning.

We are going to collect and record some of this information. For the next few minutes, we will stay together as a group to develop skills in collecting soil data. After that, you will be working on your own.

Note to instructor: Quickly (10 min.) go over the techniques for collecting the data with the participants. This instructional session is extremely important. The participants will use the skills they develop in this session when they collect data for the micromonolith.

Examples: (not necessary to discuss in this order)

1. Soil layers (Horizons)

Mark where the soil changes color and looks. Many soils have 3 major layers or horizons, i.e. top soil, subsoil and parent material; because soil formation has many variables you may find more or less. (Measure and record the depth of each major layer).

2. Color

Describe and record the color of each major layer.
(Have participants pick their own description of color.)

3. Texture (How the Soil Feels)

Determine and record the texture of each major layer.

Texture is determined by feel (push and rub moistened sample between thumb and forefinger. Spit on sample to moisten.)

If it feels gritty.....sand

If it feels smooth and slick, not very sticky.....silt

If it feels smooth, plastic, very sticky.....clay

Note: Have samples of sand, silt, clay in cans. Have participants practice with these samples to find out what the textures feel like before determining textures of the soil profile.

4. Structure (How the soil is put together)

Determine the structure of each major layer.

Carefully break apart a shovelful of soil from each layer and match its characteristics with one of the structure words on the lab sheet.

5. Temperature

Determine and record the temperature of each layer. Plant's growth depends upon soil temperatures during the growing season. Find out your growing season before lesson.

6. pH (acidity or alkalinity)

Determine and record the pH of each major layer. Plants need many soil nutrients to grow well. The degree of pH affects how plants grow.

Note to instructor: Demonstrate how to use pH kit in front of whole group. Use some foreign material like cigar ashes. Mention not to compact the sample in the porcelain dish, just use enough pH reagent to saturate soil sample, match color at the edge of the soil sample and porcelain dish with pH color chart.

IV. CONSTRUCTING A SOIL MICROMONOLITH

We are going to use the skills we just developed to construct a soil micromonolith. (Explain: a micromonolith is a small cross section of this profile. You can make one by just sketching the layers on the profile sketch in Task C, or putting samples of each layer in a baby food jar, etc.)

Notice there is a place to check or record the data you collect, and a place to sketch what the soil looks like.

TASK C: (20-30 minutes) Work in small groups or by yourself

Using the skills you have just developed, and the available equipment, construct a soil micromonolith of this soil profile. Record your observations on the soil micromonolith lab sheet. You may want to make a micromonolith using the cards and jelly cups; if so, ask your instructor.

When finished with this task, report to the instructor to receive **TASK D.**

Air temperature 3 ft. above soil surface	
Air temperature just above soil surface	

Sketch your soil profile, label the layers or horizons and record the data.

DATA

PROFILE SKETCH

Contents of material above soil: _____, Depth ____ " to ____".

A. (Horizon): Depth ____ "to ____", Color ____
Texture: ^{Topsoil}Sand ___, Silt ___, Clay ___
Structure: Columns ___, Blocky ___,
Platey ___, Granules ___. pH ___, Temp. ___,
____ F, Plant Roots Visible ____.

Record below the same information above
for the rest of the layers.

Describe type of rock in the bedrock (if present)

V. ANALYZING YOUR SOIL DATA.

TASK D: (20-30 minutes) Work in small groups or by yourself.

Use the soil data you collected and the following tables answer the following questions:

Effect of Soil Depth on Plant Growth and Water Storage

Deep Soil (over 42") Excellent water storage and plant growth

Mod. Deep Soil (20"-42") Good water storage and plant growth

Shallow Soil (20" & under) Poor water storage and plant growth

The potential of my soil for water storage and plant growth is:

excellent _____ good _____ poor _____

Why? _____

Some Relationship of Color to Soil Conditions

Top Soil Condition	Dark (dark grey, brown to black)	Moderately Dark (dark brown to yellow-brown)	Light (Pale brown, to yellow)
Amount of organic material	Excellent	Good	Low
Erosion factor	Low	Medium	High
Aeration	Excellent	Good	Low
Available Nitrogen	Excellent	Good	Low
Fertility	Excellent	Good	Low

Subsurface Soil Color (B Horizon)	Condition
Dull Grey (if in low rainfall soils)	Water-logged soils, poor aeration
Yellow, red-brown, black (if in forest soils)	Well drained soils
Mottled grey (if in humid soils)	Somewhat poorly to poorly drained soils

- a. What can you say about the following, based on the color of the top soil, or A horizon?

amount of organic material _____

erosion factor _____

fertility _____

- b. What can you say about the drainage in the B horizon, based on color?

TASK D - continued

Soil Investigations

Texture	Effect of texture on - -	
	Water holding capacity	Looseness of soil
Sand	Poor	Good
Silt	Good to excellent	Good
Clay	High (plants can't use it in clay)	Poor

My soil textureSoil water-holding capacityLooseness

Topsoil (A)

Subsoil (B)

Effects of structure on soil conditions

Type	Penetration of water	Drainage	Aeration
Columns 	Good	Good vertical	Good
Blocky 	Good	Moderate	Moderate
Granular 	Good	Best	Best
Platy (low rainfall soils) (like stack of plates 	Moderate	Moderate	Moderate

Using the structures you recorded, and the chart, "Effects of Structure," what can you say about the drainage properties of your soil for:

Topsoil (A) _____

Subsoil (B) _____

1	4.5	6.5	7	8.5	14
(1 to 4.5 is too acid for most plants		(Most plants do best here)		(8.5 to 14 is too alkaline for most plants)	

Example of plants in pH range:

pH 4.0 - 5.0: rhododendrons, camellias, azaleas, blueberries, fern, spruce

pH 5.0 - 6.0: pines, firs, holly, daphne, spruce, oaks, birch, willow, rhododendron

pH 6.0 - 7.0: maple, mountain ash, pansy, asters, peaches, carrots, lettuce, pines, firs

pH 7.0 - 8.0: beech, mock orange, asparagus, sagebrush

Using the pH ranges you recorded and the table, "Examples of Plants in pH Range," complete the following chart:

Some Plants That Could Grow Here Based on the pH and Chart	Some Plants Actually Observed Growing Here

TASK D - continued

Did your inferences about the soil pH-plant relationships check out?

Yes No Explain: _____

Is pH the only factor affecting where plants grow? Yes No

Explain: _____

Describe in a short paragraph how you would set up an experiment to collect data and construct your own soil pH-plant relationship chart.

Soil temperature

Soil Temperature	Conditions during growing season
Less than 40° F	No growth, soil bacteria and fungi not very active
40° F to 65° F	Some growth
65° F to 70° F	Fastest growth
70° F to 85° F	Some growth
Above 85° F	No growth

The growing season for my area is _____

What does the soil temperature chart tell you? _____

In the space below, convert the soil temperature table to a line graph.
(5-10 minutes) Work by yourself.

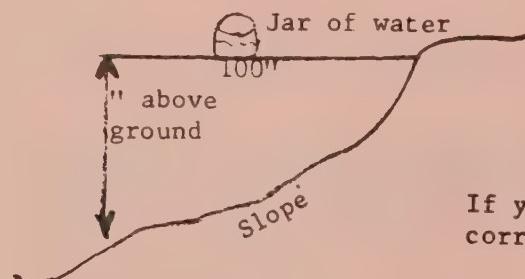
VI. DETERMINING SOME LAND USES

Questions and discussion: We have all the information we need except the slope of the land, to discuss some land uses here.

TASK E

Determining the Slope of the Land

1. Select a place that represents the average slope of the land being studied or take several measurements and average them.
2. Place one end of a 100" stick on the slope you want to measure. Hold upright to be about level.
3. Place a level or jar with some liquid in it on the upright stick. Raise or lower the stick until level.
4. Measure the number of inches the free end of the stick is off the ground.
5. The number of inches is the slope of the land in percent.



If you use a different length stick, then correct by using the conversion table below.

Conversion Table

Length Stick Used	No. inches the end of the stick is above the ground	Multiply by conversion factor	% Land
100"	_____	X 1	=
50"	_____	X 2	=
25"	_____	X 4	=

Land Use Chart

This is a chart for soils in one kind of land, climate and plants. Other areas may require a different set of criteria.

<u>Agriculture Uses</u>	<u>Slope</u>	<u>Erosion Hazard</u>	<u>Soil Depth</u>	<u>Drainage</u>	<u>Texture</u>
Farm crops-cultivation good soil mgmt. practices	0-3	None	Deep	Well drained	Loam or silt loam
Farm crops-few to several special cultivation practices	3-20	Slight to moderate	Mod. deep	Somewhat poorly	Sandy loam or silty clay
Occasional cultivation many special practices	20-30	Severe	Shallow	Poor	Sand or clay
Pasture-woodland culti- vation, no machinery can be used	0-2	None to slight	Deep	Well to poor	Stoney
Pasture, timber growing, woodland, wildlife, no cultivation machinery	30-90	Very severe	Deep to shallow	Well to poor	Sandy, silty, claying or rocky
Wildlife, recreation	all	None to extreme	Deep to shallow	Excessive to poor	Rockland, river wash, sand dunes

The most limiting soil factor will determine the best agricultural use of the land.

Occupancy land uses by man--

Man's valued uses of land has demanded criteria, in addition to agricultural uses, to determine proper management practices for living on the land. (Examples of others include: prescriptions for aesthetic management, soil site indexes for growing timber, criteria for greenbelts, etc.)

<u>Some Uses & Factors Affecting That Use</u>	<u>Slight Limitation</u>	<u>Moderate Limitation</u>	<u>Severe Limitation</u>
Roads and Streets			
Slopes	0-12%	12-30%	Over 30%
Depth	Over 40"	20-40"	Less than 20"
Watertable	Over 20"	10-20"	Less than 10"
Building Sites			
Slopes	0-12%	12-20%	Over 20%
Depth	Over 40"	20-40"	Less than 20"
Watertable	Over 30"	20-30"	Less than 20"
Septic Tank Filter Fields			
Slope	0-7%	7-12%	Over 12%
Depth	Over 6'	4-6'	Less than 4'
Watertable depth below trench	Over 4'	2-4'	Less than 2'

Picnic and Camp Areas

Slope	0-7%	7-15%	Over 15%
Stones	0-20%	20-50%	Over 50%
Watertable during season of use	Over 30"	20-30"	Less than 20"

TASK F: (20 minutes) Work in small groups

Using the data from Task D, Task E, and the land use chart, answer the following questions.

According to the agriculture and occupancy land use charts, this land could be used for:

Agriculture use:
(list & explain why)

Occupancy: (yes or no and with what limitations)

Roads and streets

Building sites

Septic tank filter fields

Picnic and camp areas

I feel the best uses of this land would be: (justify your answer)

Questions and discussion:

1. How have you classified this land?
2. Based on your observations and the data you collected, do you feel this land is being properly used?
3. In your estimation, have man's activities affected the classification of this land?
4. Could man improve the capability of this area? How?
5. How could man reduce the capability of this area?

TASK G: (10 minutes) Work by yourself.

Using the words from the data you collected and recorded on the soil micro-monolith card, write a description of the soil in your soil study. Compare this description with the one you wrote at the beginning of the session.

Questions and discussion:

1. What are some factors that contribute to soil formation?
2. What evidences of geological changes have you noticed in this area?
3. What other factors might affect uses of the land? (climate, growing season, needs of community, economic, past history of uses, etc.)

VII. COMMUNICATING FEELINGS, AWARENESS, AND VALUES ABOUT SOIL

TASK H; (10 minutes)

Describe what you can do to improve the use of the soil: in your backyard.
in your community.

Ask for individual descriptions and have group discuss. Relate back to comments to questions after TASK F.

What types of community action can we take to identify and help solve soil and land management problems in our community? How do these relate to zoning laws, planning commissions, local and state political discussion-making?

Take this data or processes of collecting data and identify a local land use problem and develop a simulation game similar to the Center Place game. (See Lesson Plan Outline for an Environmental Land Use Simulation Game.)

SUMMARY QUESTIONS

1. What did we find out about the environment in our study today?
2. How are soil characteristics important in environmental management?
3. How can we summarize our discussions and investigations?
4. What processes and methods did we use in our investigation today?
5. Let's review the behavioral outcomes for this session to see if we achieved our objectives. (Read list and have group comment.)

(Point out that the evaluation and testing was built into the task-oriented jobs that demanded the learner to do something.)
Distribute lesson plan outlines and other materials.

TASK I:

Describe in writing how you feel about our session today. (Evaluation)

BEHAVIORAL OUTCOMES IN KNOWLEDGE

As a result of these activities, you should be able to:

Describe 3 ways in which the living organisms in the top part of the soil affect the soil.

Construct a soil micromonolith of an assigned soil profile, determine and record texture, structure, pH, temperature, and color of each layer.

Construct a written description of a soil you studied, using the words you recorded about that soil on your micromonolith.

Demonstrate the ability to determine the best uses of the land in this area, using the data from your soil micromonolith and the land capability charts.

Describe 3 things that man does to determine the proper management of the soil resource.

BEHAVIORAL OUTCOMES IN FEELINGS, AWARENESS, VALUES, AND ACTION

As a result of these activities, you should be able to:

Describe how you feel about man's effect on this soil environment.
Describe how you feel about man's effect on the soil environment where you live.

Describe what you can do to improve the use of the soil:
in your backyard:
in your community:

EQUIPMENT NEEDED: (for a class of 30 people)

6 La Motte soil pH kits	100 jelly cups and lids	3 staplers
30 micromonolith cards	3 soil thermometers	1 box staples
6 tape measures	2 #10 cans of water	2 shovels
30 sets of lab sheets	30 hand lenses	3 yardsticks
3 sticks (50" or 100" long)	3 baby food jars, $\frac{1}{2}$ -full of water	
labels to differentiate soil horizons		

This lesson plan was developed for use in teacher workshops by:

Phyllis Enger, Seattle Washington

Dave Kennedy, Olympia, Washington

Don Cannard, Vancouver, Washington

Ernie McDonald, Portland, Oregon

George Otte, Hillsboro, Oregon

The lesson plan was revised in November 1971. It is suggested by the writers that continuous revision take place by people who use the ideas.



A LESSON PLAN FOR INVESTIGATING A FOREST ENVIRONMENT

Set the stage for this investigation by reviewing quickly what will take place in the allotted time. For example: In the next four hours we are going to make some inferences of why we think some things are the way they are based on observations; test out those inferences by experimentation, collect and interpret past events in this experiment, and explore ways that we can improve the efficiency of energy cycles. (You might want to read the behavioral objectives at the end of the lesson and refer back to them as evaluation of the session.)

The following activities may help you look for observable changes, relationships, patterns and trends, in order to interpret past events, understand present relationships, and indicate future trends in the forest environment.

The processes used in this lesson plan can be replicated in any environment. Some of the activities used cannot. In environments other than a forest, you may have to develop activities appropriate to the area.

I. OBSERVING AND INFERRING WITH CROSS SECTIONS. (as an example of using observable evidences to infer past events in a forest)

Distribute cross sections and task cards. Cross sections of trees can be 4-6" in diameter or larger, and should show a variety of growth patterns and influences (fire, insects, etc.).

TASK A: (on cards) (5-10 minutes)

Work with 1 or 2 other people.
Write down some things you notice about the cross sections.

Questions and discussion:

1. What are some things you noticed about the cross sections?
(Accept all comments from group. List on board or chart.)
2. Focus on 2 or 3 items for discussion:
Why did you say....(your crossection had evidence of fire)? (examples)
What could account for....(the rings being irregular)?
What are some things that could account for....?



TASK B: (on cards)
(10 minutes)

Work with 1 or 2 other people.

Select 3 observations about the cross sections from the group list.

List possible reasons for these observations.

List ways you could set up an investigation to find out more about your observations and inferences.

<u>Observation</u> <u>(What You Noticed)</u>	<u>Inferences</u> <u>(Possible Reasons For This)</u>	<u>Investigations</u> <u>(How We Could Find Out)</u>
1.		
2.		
3.		

Questions and discussion:

1. Ask for reports on the above chart from several groups. (as time allows)
2. Which of these investigations could be carried out in this environment?
3. Keep your lists of observations and inferences for reference at the end of this session.
4. What could tree rings from this forest tell us about past and present events in this environment?

II. COLLECTING AND INTERPRETING DATA ABOUT TREE GROWTH RATE AND COMPETITION

Task C (with tree cores) requires preparation by the instructor before the session.

A tree stand should be selected for study, 4-5 trees tagged (trees should be selected that show effects of environmental conditions--injury, overcrowding, lack of sunlight, etc...). The tagged trees should be bored with an increment borer, by the instructor ahead of time. (Cores should be numbered corresponding to numbers on the tree. Putting tree cores in see-through plastic straws and then taping to a cardboard will help keep them longer if liquid resin is not available. In any event, keep the cores and labeled trees to use again. This eliminates the necessity of reboring the trees.

NOTE: Maybe you can find and use stumps of trees that grow under a variety of competition influences instead of tree cores.

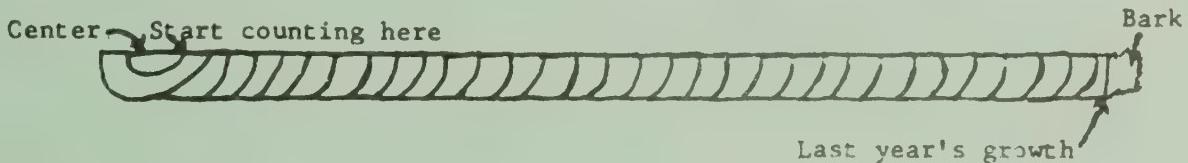
TASK C: (Part 1) (15-20 minutes) Work in groups of 4-5 people

1. Observe the tree core your group has been given and record the following information: (See drawing of tree core to help interpret the tree core you have been given.)

Tree #	# Dark Rings From Center to Bark (Approx. Age)	# Dark Rings in Last Inch	Remarks about the pattern of the rings

2. When your group has the above information, one person from the group should record this information on the blackboard or easel board. Chart to be like TASK C, part 2.

DRAWING OF TYPICAL TREE CORE



(Part 2) (10-15 minutes) Work in small groups

Record the following information about tree cores from the master chart. (Instructor will provide the diameter information.)

Tree #	# Dark Rings From Center to Bark (Approx. Age)	Diameter of Tree Trunk (Cir. + 3)	# Dark Rings in Last Inch	Remarks about the Ring Pattern
1				
2				
3				
4				
5				
6				

Questions and discussion:

1. What similarities do you notice in the data about the trees?
2. What differences do you notice in the data about the trees?

TASK C: (Part 3) (20-30 minutes) Work in small groups

Set up an investigation to find out reasons for some of the differences in the data.

1. Select 2-3 trees from the list that show differences in growth rates.
2. Which trees did you select? (Indicate by number) _____
3. Why did you select these trees? _____

Go with your group to the site of the trees you selected for investigation and do (Part 4)

(Part 4) (30-40 minutes) Work in small groups.

Collecting and Recording Data

Record your observations:

Interpreting Data

Record possible interpretations of the above data:

Summarizing your Investigation

Write your group's summary below, including:

- what you were trying to find out
- what data you collected about it
- what interpretations you made
- what other data would you collect about your investigation?

Questions and discussion:

1. Ask for 2-3 minute summaries from several groups. (as time allows)
2. What problems did you encounter in this task?
3. What other data could you collect about your investigation?
4. What does the information tell us about the past events of this environment?
5. How would you summarize the major factors affecting the growth of this forest?

III. INTERPRETING PAST EVENTS

TASK D: (30-40 minutes)

Look for evidence of change (natural and man-made) in the environment.
Record and fill out other columns.

Evidence of Changes in the Environment	What Might Have Caused Them?	Effect on the Environment

Describe the way the area around you looked:

25 years ago

Describe how you think the area around you might look:

25 years from now

Questions and discussion:

1. What evidence of change did you find?
2. What might have caused this?
3. What was the effect of _____ (this change) on the environment?
Allow time for interchange of ideas between group members. The same changes may have been noticed, and there may be many interpretations of their causes and their effects.
4. What do you think this area looked like 25 years ago?
5. How do you think this area will look 25 years from now?

TASK E: (10 minutes)

Describe in writing how you feel about the changes in this environment.

IV. INFERRING CHANGES IN A ROTTEN LOG OR STUMP

Find a rotten stump or log

Questions and discussion:

1. What things about this stump give us clues about the past events that have taken place?
2. What factors caused these things to happen?

TASK F: (15-20 minutes) Work in groups or by yourself.

NOTE: DO NOT TEAR THE STUMP APART! Discuss why.

What things are changing the rotten stump now? Record below:

*Living things	Effect on Stump

*Non-Living things	Effect on Stump

Questions and Discussion:

1. What cycles are taking place in the rotten log or stump?
2. In the space below, construct a diagram of one of the cycles taking place in the rotten log or stump:

TASK G: (15 minutes) Work in groups.

Construct a diagram of one of the cycles taking place in the rotten log or stump.

V. TRANSFERRING THE PROCESS TO OTHER ENVIRONMENTS

Questions and Discussion:

1. What are some other things in this environment that could help us further interpret the landscape and what it can tell us about the landscape. List on board.
2. Using one of the items listed in one or another you can think of, do TASK H.

TASK H: (30 minutes)

Describe in writing an alternative activity you could have done to establish a time sequence for the past events in this environment.

Describe in writing an activity you could do in a city environment to establish a time sequence for the past events in the environment.

Activity

What it would tell you about the past events in the area

Describe an activity you could do in the area around your school to establish a time sequence for the past events in the area.

Activity

What it would tell you about the past events in the area

VI. COMMUNICATING FEELINGS OF AWARENESS THROUGH SKETCHING

Distribute sketching paper, and pieces of charcoal from a campfire or fireplace.

TASK I: (give these directions verbally)
(Use sketching paper)

Construct a sketch using charcoal from a campfire or fireplace.
Other sketching materials will be given to you as you work.

NOTE: Subject of sketch depends on the environment.

It can be anything that is significant about the area....
rotten log, stump, or snag
an old homestead, fence, or barn
a city building, transmission tower, or freeway

While people are sketching, go around and give them:
rotten wood - brown dandelion leaves - green dandelion flowers - yellow
other goodies, in season
If you're not in the woods, IMPROVISE!

VII. COMMUNICATING FEELINGS OF AWARENESS AND VALUES THROUGH WRITING

Note: Begin this part when about half the people finish their sketch.

TASK J: (give these directions verbally)

Use your pencil or pen.

Find a place on your sketch (across the bottom, or down the side) to write some things.

Write 2 descriptive words about the stump.
(words that tell what it looks like)

Write 3 action words about the stump.
(words that describe processes or changes taking place, or things happening to it)

Write a short phrase (4-5 words) that tells how the stump affects the rest of the environment. (a phrase to describe its value or usefulness) (or a phrase describing any thought you have about the stump)

Write 1 word that sums up everything about the stump.
(a word that suggests a comparison, an analogy, or synonym)

Optional:

Now, if you wish, go back and give a title to what you have written.

Congratulations. You have just written a poem about the stump or whatever you wrote about.

Note: Pace the above directions to the needs of the group.

People shouldn't feel pressure while writing this -- be casual.

(It's good to mention that they may not wish to write something for every direction that is given.)

Review the directions now and then for people still thinking.

Have people read their writings if they wish.

Question to think about:

In what ways does this description show your feelings and awareness of the environment?

SUMMARY QUESTIONS

1. What did we find out about the environment in our session today? (list on chart, if time)
2. Why are these things important to the way we manage the environment?
3. How can we summarize our discussion? (or investigation)
(What are some big ideas that would sum up what we've just said?)
4. What methods and processes did we use in our investigations?

TASK K

5. Describe in writing how you feel about our session today.

BEHAVIORAL OUTCOMES IN KNOWLEDGE

As a result of these activities, you should be able to:

List at least 3 observations about the cross sections provided, and infer possible reasons for each observation.

Describe ways to set up an investigation to find out more about the above observations and inferences.

Set up an investigation (collect and record data) to find out reasons for growth rate differences in a given stand of trees.

Describe activities appropriate to other environments for interpreting the landscape.

Identify and list at least 3 evidences of change in the environment, and infer the cause-and-effect relationships of those changes.

Construct a diagram of a cycle in a rotten stump.

BEHAVIORAL OUTCOMES IN FEELINGS, AWARENESS, VALUES, AND ACTION

As a result of these activities, you should be able to:

Describe how you feel about one change in this environment.

Communicate feelings of awareness by constructing a sketch of a given object in the environment, using natural materials.

Communicate feelings, awareness, and values by describing in writing the effect of a given object on the environment.

EQUIPMENT NEEDED

30 cross sections of trees

6 increment cores (preferably in plastic) from numbered trees

30 hand lenses (optional)

30 pieces sketching paper

lab sheets

task cards

natural materials for sketching

This lesson plan was developed for use in teacher workshops by:

Martha Neyland, Stevenson, Washington

Jeannie Williams, Salem, Oregon

Charline McDonald, Portland, Oregon

The lesson plan was revised in November 1971. It is suggested by the writers that continuous revision take place by people who use the ideas.

A LESSON PLAN FOR COMPARING ENVIRONMENTS

It is exciting and important to make a comparison between two environments. This can provide an opportunity for a group to explore the factors that allow for differences and likenesses in at least two parts of our total environment.

After an in-depth study of two different environments, have small groups do
TASK A.

(Note: An in-depth study of a Forest Environment might include the investigation of Land Use Planning, Measuring Some Water Quality Criteria, Investigating a Forest Environment, and Environmental Habitats. An in-depth study of an Urban Environment might include the investigations of Land Use Planning, Water Quality Criteria, and Urban Investigation.) It might even be between two different ecosystems such as a forest and a meadow.

TASK A: (15 minutes) Work in small groups.

Analyze the data collected for each environment and do the following:

1. List some things you found out about _____ environment.

2. List some things you found out about _____ environment.

Questions and discussion:

1. List and group items on board.
 2. Which things are similar in each environment?
-



TASK B: (15 minutes) Small groups.

List at least four basic functions of each environment.

- _____ environment _____ environment
- 1.
 - 2.
 - 3.
 - 4.

TASK C: (15 minutes) Small groups.

List three factors that affect the quality of the two environments.

- _____ environment _____ environment
- 1.
 - 2.
 - 3.
 - 1.
 - 2.
 - 3.

Questions and Discussion:

1. Discuss the results of TASK B-C with the group and list on board next to TASK A results.
2. In what way (if any) will the environments have an affect on each other?
3. Based on your own investigations, what are some general factors that apply to both environments?
4. What reasons can you suggest for the similarities and differences between these factors?
5. Summarize the unique contribution of each area to the society.
6. Why are the items in TASK A, B, and C important to the way we manage environments?

TASK D: (15 minutes) Small groups.

List at least four of the most obvious problems of the two environments.

- _____ environment _____ environment
- 1.
 - 2.
 - 3.
 - 4.

TASK E: (20 minutes)

List at least four guidelines that you would use in planning for future land uses in both environments.

1. _____ environment

2. _____ environment

TASK F:

What can we say about Environments?

BEHAVIORAL OUTCOMES IN KNOWLEDGE

Identify four basic functions about each environment.

Describe three ways in which the environments are interrelated.

Identify three factors common to both environments.

Describe three similarities and differences between each environment.

BEHAVIORAL OUTCOMES IN ATTITUDES, AWARENESS, VALUES AND ACTION

Describe at least two unique contributions that each environment makes to society.
Identify at least three guidelines that you would use in planning for management of the environments.

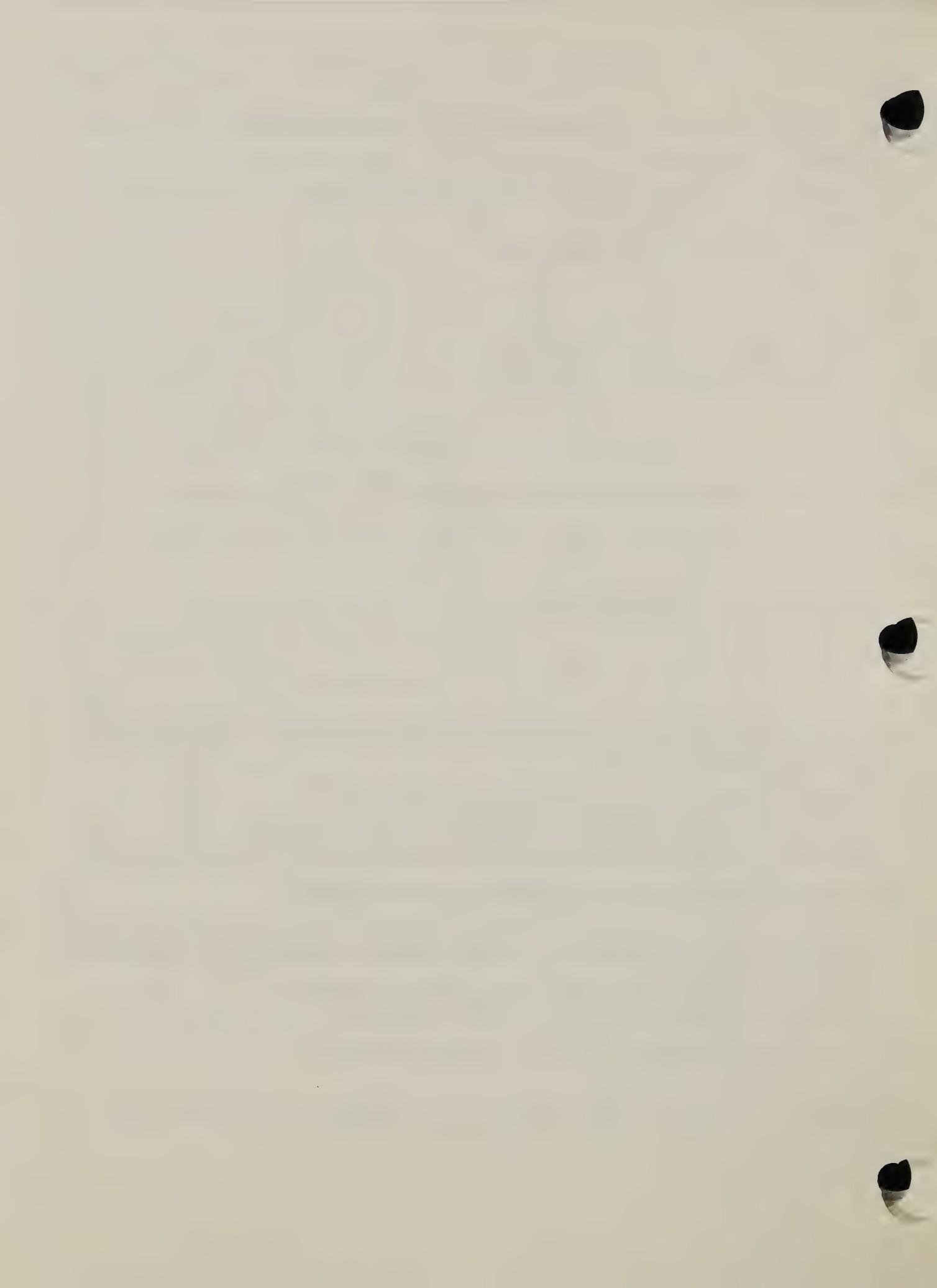
Describe how you feel about man's use of each environment.

Describe your recommendations for the future management of the area.

This lesson plan was developed for use in teacher workshops by:

Ernie and Char McDonald

The lesson plan was revised in November 1971. It is suggested by the writers that continuous revision take place by people who use the ideas.



A LESSON PLAN FOR A LAND USE SIMULATION

The Information About Simulation Games (Use as needed to set stage)

Simulations are operating models of real life situations. They may be about physical or social situations.

Most simulations for classroom use involve role-playing--the roles being acted out to correspond to the functioning of some real process or system.

Most simulations for classroom use involve gaming (a game is defined as something enjoyable--however serious it might be--involving competition for specified objectives and observing rules).

Some simulation games are based on environmental issues. What are some benefits of using simulation games as an instructional technique for investigating environmental problems?

They're fun.

They get people involved.

Logistically easy way to prepare people for an environmental experience.

People analyze cause-and-effect relationships of environmental issues.

People are put in role-playing situations where they have to suggest alternative solutions to environmental concerns.

People are forced to evaluate the consequence of decisions in discussion or on paper before these decisions are carried out in reality. People interact with each other in the decision-making process.

...simulation games not only:

develop understandings about problems in the environment and
develop awareness and concern about those problems

but they

help people develop skills they need for citizen action and involvement
in environmental management.

Introduction

The kind of techniques used for simulation games in school classrooms combine elements of simulations, games, and role-playing, where students assume the role of decision-makers in a simulated environment and compete for certain objectives according to specified procedures or rules.

We are going to participate in a hypothetical simulation game, analyze what we've done and give you some ideas to develop your own simulation game based on local environmental issues or concerns.

I. INFERRING, RECORDING AND CLASSIFYING POSSIBLE USES OF LAND.

Discussion

A. Distribute TASK A, Centerplace City Land Use Problem.

B. The problem to be decided is what are some possible uses for the one-square mile (640 acres) of county farm land, four miles northeast of the city. It is now available for the city's use.

Read the problem on the Task Card to the total group.



TASK A: (10 minutes) Work by yourself.

Read the background information for Centerplace City, and then list some possible uses of the vacant farmland.

"One square mile of unused county farmland, four miles northeast of the city is now available for the city's use."

Background Information Sheet: Centerplace City

The population is 250,000 and rapidly increasing.

The city's boundaries are being extended, but the suburban fringe is expanding even more rapidly.

The rapid population growth is accompanied by demands for more housing, more jobs, additional city services, and recreational areas.

The power for industrial uses, adequate public transportation, and a skilled labor force are available.

The city is located near forests, which are to the north.

The land to the east is devoted mainly to farming.

The Pipe River is unpolluted and is the source of irrigation water as well as the municipal water supply.

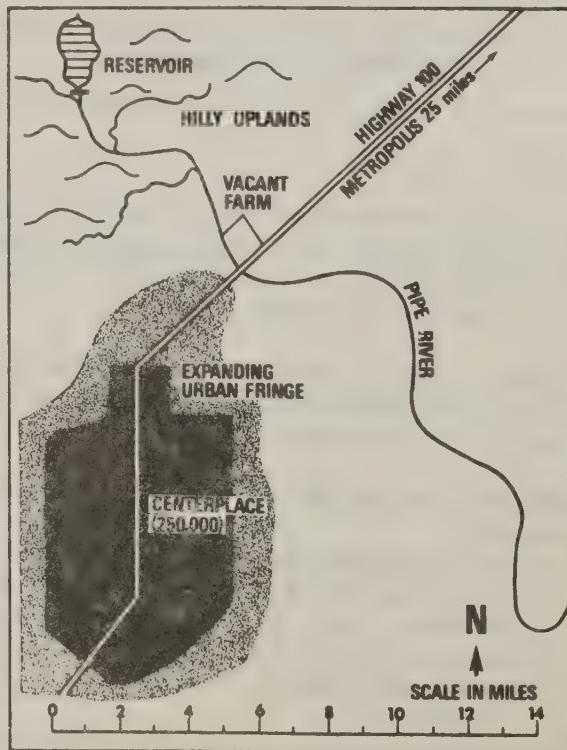
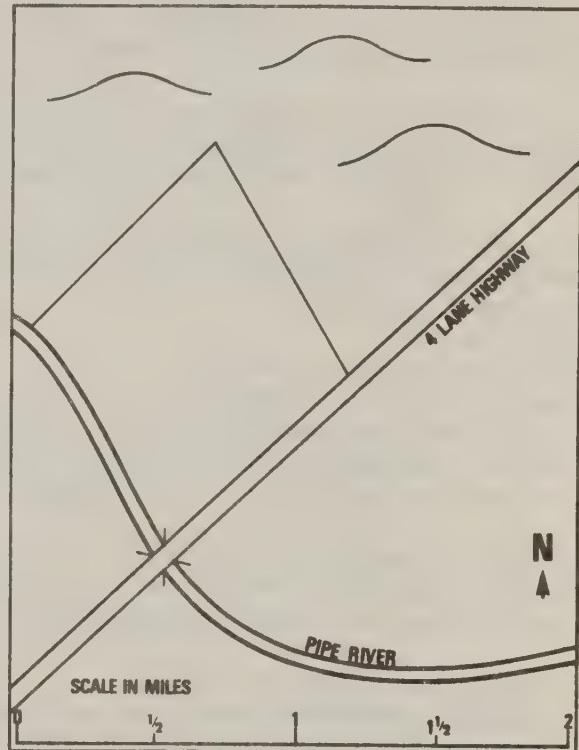
The river is too small for freight transportation, but logs could be floated on it.

The gravel bed of the river is appropriate raw material for concrete manufacture.

The present sewage treatment plant and garbage disposal area are at maximum capacity. The citizens of Centerplace are concerned about the maintenance of a scenic regional environment.

The County Board of Control is the authority for land zoning, and many citizens' groups are developing to influence zoning decisions.

List possible uses of the land below:



Questions and Discussion

Note: When most people have started to write down uses on Task A, go ahead with question #1.

1. "What are some possible uses for the undeveloped land?" (B _____ write on board.)

(As people respond, write all comments on board, just as they say them. Don't paraphrase for them unless they are too wordy, in which case, ask: "How shall I write that on the chart?" If they give major categories right away, like Recreation, or Industry, say, "Can you give me an example of that?")

(Number the items as you go along--they can refer to them by number later.)

(When you get 15 or 20 items, STOP.)

2. "Which of these uses are similar?" (Designate similar uses by letters--A by all of one group, B the next, etc.)

When most are designated with a letter, or they seem to run out of thoughts, STOP. (It's okay to change the groups if they change their mind along the way in the above.)

3. "What label could we give to all the items in A?"

(It's okay if they suggest more than one label for Group A; write them both down.)

"What label could we give to Group B?", etc.

e.g. Recreation, Industrial, Utilities, Housing, Commercial.

I. DEVELOPING AND GIVING PRESENTATIONS.

1. Divide the class or group into the number of categories decided on in #3. (shouldn't be more than 6-10 in each group), and assign each group to one of the use categories.

2. Each group is to represent the special user group assigned.

3. Pass out TASK B--you have 10 minutes to list and analyze possible uses for the vacant land in your assigned category. You may consider those listed on the board plus any other possible uses you can think of for your category.

TASK B: (10 minutes) Group # _____ Assigned Category of Land Use _____

Your task is to analyze and list possible consequences of different land uses within your assigned land use category.

Use	Advantages to land/people	Disadvantages to land/people

(At end of 10 minutes go on to #1 below)

Discussion:

Tell group:

1. Now go on to TASK C--you have 20 minutes to plan a strategy and develop a 3-minute presentation to be made to the County Board of Control.
 - a. This presentation will be a proposal for developing the undeveloped farmland.
 - b. You must have a visual display such as a land use map drawing as a part of your presentation.
 - c. More than one person in your group must help in making the presentation.

TASK C: (20 minutes)

Develop a strategy and presentation for presenting your plan of development to the County Board of Control.

Discussion and Questions

Note:

1. (If possible, have a staff person assigned to each group to make written observations about how the group was able to work together to solve the problem.)
2. 10 minutes into Task C, tell total group that the current County Board of Control has quit due to environmental impact workload and each group has one minute to elect one member to represent them on the Board. Take the Board into another room and tell them they will be responsible to hear the presentations and decide upon the best one. Their job in the next ten minutes is to: (Depending on time constraints for playing the game, consider no rebuttals from the group, limited questions from Board, etc.)

BOARD OF CONTROL

TASK C₁: (10 Minutes)

In the next 10 minutes you are to:

1. Select a chairman to call on the groups and to chair the board meeting. (At outset, chairman will appoint a timekeeper to give a 2-minute warning and cut each presentation off at 3 minutes.)
2. Develop the criteria you will use in evaluating the proposals based on the needs of the people and characteristics of the land.
3. Develop some kind of table (example below) you can use in recording your evaluation of the presentations while they are being given.

Presentation	Criteria		

3. Twelve minutes after groups start planning Task C remind them they have eight minutes left to have their verbal and visual presentation ready. Let groups have five more minutes to finish if needed. Remind them that more than one person must help in the presentation.
4. Have Board of Control enter room and sit up front. Appoint a timekeeper to cut all presentations off at three minutes (give two-minute warning). Announce: Because of time, there will be no rebuttals or discussion (the Board may want to ask questions or have rebuttal time after all presentations. However, allow only 5-10 minutes for this part so it won't get out of hand.)
5. After #4 is finished, the Board retires for 5-10 minutes to select the best proposal.
6. While Board is meeting, each group is to develop a list of criteria they think should be used in the decision.
7. County Board of Control announces their decision and gives reasons why.
8. County Board of Control reads their criteria aloud.
9. Did new leadership emerge during this session? What factors enabled this to happen? (Call on staff observers if used.)
10. Did your group work as a team? What did your group do to insure participation by all members of group?
11. What happened in the groups? How did you feel as a person? What about the criteria used? How did each observer see the interaction in the groups? How did you feel about representing an interest group you may not have agreed with?

This is the most important part of the Session:

12. What additional data would you have liked to have had for your groups? List on board, e.g., topography, vegetation, economy of area, railroad, shopping center, adjacent land, climate, soil survey, historical information, flood plain, wildlife, interest of board of control, money available, educational needs, reg. by State, existing zoning, political climate, population (age, needs, race, jobs). What groups might support each interest, etc.

(Note: This is one of the most important parts of the activity because it emphasizes that we need a variety of information and data before we can intelligently make a land management or environmental decision to best meet the needs of people and their environment. This list has all the elements that need to be considered in studying a local environmental issue or concern. It also includes elements of all the curriculum subject matter (social studies, science, language arts, Etc.)

Case Histories:

1. High school class in Economics transferred this technique to a real land management problem in Portland, Oregon.

2. Junior high school class of teachers and kids used this to start communicating and then developed a new community curriculum to better meet needs of students (Milwaukie, Oregon).
3. Forest Service Advisory Committee used this to become more familiar with land management factors (Corvallis, Oregon).
4. An elementary school used as 5th grade projects to look at community (Olympia, Washington).
5. Develop a school yard

This is only one way to plan a simulation game. The format or structure can take any form you want.

III. ANALYZING CHARACTERISTICS OF SIMULATION

1. "One group of people working with simulation games have identified at least three basic characteristics of most simulation games."
 - Ask: "What was the clearly defined problem in the Land Use Alternatives Simulation?"
 - Ask: "What factors influenced the decision in the Land Use Alternatives Simulation?"
 - Ask: or Tell: "We assigned groups to fit each role in the Land Use Alternatives Simulation, but we all helped develop that role by the items we listed on the chart."
2. Optional (Note: If the group is interested in a more in-depth analysis of the elements of simulations use the following list. Have a copy for each person.)
 - a. One important characteristic of a simulation is a clearly defined problem, including the choices available to the decision makers.
 - (1). How would you formulate the problem or issue you were asked to decide upon?
 - (2). Did the developer of this simulation simplify the choices?
 - (3). If so, how did he do it?
 - b. A second major characteristic of educational simulations is the factors having an influence on the decision. (Several objective and subjective factors to be considered in making a decision need to be clearly identified. These factors indicate the data that are relevant to each of the possible choices.)
 - (1). What factors were selected as influences on the decision?
 - (2). Which of these factors would you classify as objective?
 - (3). Which of these factors would you classify as subjective?

- c. A third characteristic of educational simulations is the way in which information about the problem and the variables is presented. (In many simulations, individual roles or group roles are used to perform this function. A role can be planned to incorporate a limited number of factors that influence the choice to be made.)

IV. DEVELOPING YOUR OWN SIMULATION GAME

1. "The most exciting simulation games are ones people develop themselves, based on local environmental issues in their community, state or region."
2. Can you think of some current environmental issues in your own community around which you could develop a game? Call for responses.

Purpose of this game was not to role play necessarily, but to bring out the issues, factors and cause and effect points of view.

When it is real you do need the facts and research.

3. "For the next 30 minutes, you will work with one or two other people, developing the format for a simulation game based on a local land use issue described in a news article." (Have copies of current newspaper articles available if students want to use them)
4. "At the end of that time, we would like to hear from several of you about what you have developed."

TASK D (30 minutes)

Distribute lab sheet, "Developing a Simulation Game"

(see attached lab. sheet)

Ask for reports from those who want to share.
Questions and Discussion

1. How can you use the techniques in this session in your job situation? classroom?
2. How could a game like this develop decision-making skills in environmental management?
3. Ask for reports from people in the group who have used simulation games.
4. How can we take this process and use it to involve the public in social and political decision-making action projects in the community?
5. How can we summarize the use of simulation games in environmental interactions.
6. Which of the behavioral outcomes did we accomplish in this discussion?
(Read and discuss)

TASK E

Describe how you feel about our session today.

(Have commercial games such as Dirty Water, Ecology, Coca Cola Game, Pollution, etc., on display if possible.)

BEHAVIORAL OUTCOMES IN KNOWLEDGE.

1. Identify and describe three component parts of simulation games.
2. Construct your own simulation game based on a current environmental issue.
3. Name and describe at least 10 important types of data needed before making a land management decision.
4. Identify cause and effect relationships that exist in environmental management.
5. Describe alternative solutions to solving specific problem.

BEHAVIORAL OUTCOMES IN FEELINGS, AWARENESS, VALUES, AND ACTION.

1. Describe how the information in #3 above affects your life, community, and the management of the environment.
2. Outline a plan of action to affect a solution or partial solution through the social and political decision-making process about the environmental issue you used in developing your own simulation.

Equipment needed

Blackboard or easel
Chalk or magic markers
newsprint or butcher paper (enough for each group to make visual display)
magic markers (4 colors for each group to make visual display)
masking tape
task cards
commercial games on display

The Centerplace City problem has been adapted with permission from the May 1970 Journal of Geography from the article "A Land Use Alternatives Model for Upper Elementary Environmental Education" by Dennis Asmussen and Richard Cole, University of Washington.

References:

- There are many publications on simulation games. Two that may be of value to you are:
1. Games in Geography, Rex Walford, Longman group limited, London paperback.
 2. Simulation Games for the Social Studies Classroom--from The Foreign Policy Association, 345 East 46th St., New York, N.Y. 10017. Library of Congress # 68-24538

This lesson plan was developed in February 1971 and revised in 1973 for use in teacher and resource groups by:

Charline McDonald Portland, Oregon
Ernie McDonald Portland, Oregon

The lesson plan was revised in November 1971. It is suggested by the writers that continuous revision take place by people who use the ideas.

TASK D (30 minutes)

DEVELOPING A SIMULATION GAME

Work with 1 or 2 other people.

Using a newspaper article about a local environmental land use problem, develop the format of a simulation game, considering the following items:

Identify the problem or issue to be decided upon.

Identify the choices available to the decision-makers.

Identify the factors having an influence on the decision.

Identify individual or group roles.

Identify the factors (for or against) assigned to each role.

Establish conditions for the players (i.e., resources, voting procedures, bargaining money, etc.)

Develop specific goals or objectives for the players.

Include limits or rules for what is permissible behavior (time factor, trading, no. points, money allocations, etc.).

GUIDELINES FOR DEVELOPING YOUR OWN SIMULATION GAMES

- Develop a set of procedures to be followed in playing the game.
 - A. Goals and/or objectives
 - B. Rules for playing the game
 - 1. voting procedures
 - 2. process for recording data
 - 3. time limits
 - 4. procedures for presenting data
 - C. Responsibilities of the players
 - D. Provisions for students to collect data, where obtainable, how best to obtain data.
- II. Select a particular land area in your community (examples below)
 - A. A vacant lot
 - B. An older building - possibly condemned
 - C. A small park
- III. Establish a land use problem involving the selected area. (example below)
 - A. An apartment building is being proposed for a large vacant lot that is used for a sand lot ball field.
 - B. A service station is being proposed on a corner across the street from your school.
 - C. A low cost housing area is being proposed on some land next to some more expensive homes.
 - D. A small shopping area is proposed next to a residential area.

* The land use problem might be developed from a newspaper article from your local newspaper.
- IV. Establish the groups which will have a vested interest in the development of the selected land area.
 - A. Residents who own homes near the property, planning commission, apartment building owners, construction workers, store owners near the area, children who play on the lot.
 - B. Oil company representative, residents, construction workers, parents of school children, school official, city planning commission.
 - C. Residents from the more expensive homes, construction workers, contractor, prospective residents of low cost housing, church groups, planning commission.
 - D. Residents, store owners, contractor, land developer, city planning commission.
- V. Identify the possible effect this change will have on the community.
 - A. What effect on taxes for this land and surrounding land.
 - B. What effect on land values of the area.
 - C. What effect on traffic density and pattern.
 - D. What effect on population density and make up.
 - E. What effect on schools, playgrounds, churches, stores of the area.
 - F. What effect on wildlife, and other natural environment land, water, air.
 - G. What effect on utilities - such as garbage, sewage, electricity.

VI. Some possible ways of developing the game

- A. Teacher developed - teacher plans and develops the entire game with objectives, information sheets, maps, role identification and information, playing pieces, cards for information and to present the guidelines and rules.
- B. Teachers and students develop the game with students helping to identify the problem, establishing the vested interest groups, finding out cause and effect, costs, and change. (Suggest using a prepared game or two before trying this procedure.)
- C. Teacher prepares some task cards to present a situation with some information and the group would develop the rest of the game from the task card. The task card should be clear and concise, but furnish only the general information. The students would develop the specific details.

Agencies which might be consulted for further information:

1. City Council
2. City or County Planning Commission
3. Chamber of Commerce
4. County Tax Assessor

Other resource people according to your area

1. local realtor
2. local businessman
3. apartment house owner
4. contractor
5. resident

These guidelines written by Nelson Smith and Henry Gilmore, Milwaukie, Oreg., school teachers.

SUPERHIGHWAY - A SIMULATION GAME

Object - To plot out a new super-highway from Metropolitan area x to Metropolitan area y on the map considering economic and ecological factors.

Materials - Large map of area or transparency, individual maps, role cards, work sheets.

Procedure - Introduce the large map stating that this is a hypothetical problem which we have to solve. Indicate on the map the various areas of land use - Farm, ranch, timber, marsh, hill, mts., village and city. The teacher can make a decision on the amount of discussion necessary prior to beginning game. Some of the following factors might be discussed with the class as a whole to help prepare them to make some decisions.

- a. Propose various routes and discuss possible affects.
 1. If the route was to pass through or near the city; how might affect that area.
 2. If the highway was routed south of the mountains, what affect would it bring about to the city, village and lands it passes through.
- b. What might be the cost of the various routes (this factor is built into the game as stated later).
- c. Time between cities x and y will be shorter - areas outside these cities could be developed because of less time to drive to work areas. How might this change land use areas?

After general discussion, the students should be given a role to act out in making their decision on route to be chosen. Each role is on a card with some information as to the role and some of the effect that might occur. Each student should be clear as to the role he has assumed and the teacher should check to make sure role is clear to the student.

The roles are as follows:

Farmer A, B and C - Representative of the farmers for each of the three areas on the map. They are concerned with their immediate problems -- should the highway pass or not pass through their land.

Rancher A and B - Rep. of ranches of the two areas on the map.

Timber owners A and B - Rep. of timber owners of the two areas on the map.

City Business men - Rep. of the business interests of the city.

City Residents - Rep. of the residents interests of the city.

Village Businessmen - Rep. of the business interests of the village.

Village residents - Rep. of the residents of the village.

U.S. Forest Service - Rep. of the U.S.F.S. - Concerned with area in mountains, hills and marshlands.

Fish and Game Bureau - Rep. for fish and game protection - concerned with area in mountains, hills, marsh lake and rivers.

Sportsman - Rep. for hunters and fishermen.

Environmental Protection Groups - Three rep. who are interested in protection of the environment

County Planning Commission - Decision making body of 3 to 5 students who make the final decision on which route to select on the basis of the presentation by the rep. of the various interest groups.

The roles may be assumed by individual students or in pairs of students as found appropriate to class size.

To facilitate decision making each of the interest groups have been assigned to a committee to develop a plan which will be presented to the County Planning Commission. The committees are made up of the following representatives:

Committee I

Farmer A, City Businessman, City Residents, Timber Owner B and one Environmental Protection Representative.

Committee II

Rancher A, Fish and Game, Sportsman, Timber Owner A, U.S. Forest Service and one Environmental Protection representative.

Committee III

Farmer B, Farmer C, Village Businessman, Village Resident and one Environmental Protection representative.

Once the students have their roles and have established their committees, a spokesman should be selected for each committee to present their proposal to the County Planning Commission.

Each student should be given a map and a work sheet in order that they can individually develop a route that would be most advantageous to their interest. Then in a committee they will discuss and determine the best route that would satisfy the interest of their committee members. This should result only after considerable discussion, bargaining and compromising.

When a route has been selected by the committee, they should prepare their proposal for presentation to the County Planning Commission.

The work sheet is used by the student to determine the economics of purchasing and construction of the highway.

To determine the cost of purchasing land to build the highway, a number between 1 and 4 has been used.

1. = low cost
2. = moderate cost
3. = high cost
4. = extremely high cost

On the work sheet these numbers are found in the first column. To determine the cost of constructing the highway through the various areas, a number of 1, 2 or 3 has been used.

1. = low cost
2. = moderate cost
- 3 = high cost

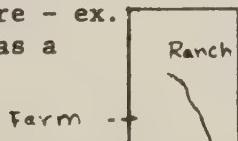
On the work sheet they are found in the second column.

To determine the cost of developing the highway, the student will count the number of squares that his intended route will cross in each area. For example, the use of the score sheet would be as follows: If the route passed through 12 squares of ranch land, 3 squares of mountains, 4 of hills, 0 of ranch, 0 of river, 4 of timber, 9 of farm, 1 village and 0 of city.

Type of Land	Purchasing Cost	x	Cost of Development	x	Number of Squares	=	Total Cost
Ranch	1	x	1	x	12	=	12
Mountains	1	x	3	x	3	=	9
Hills	1	x	2	x	4	=	8
Marsh	1	x	3	x	0	=	0
River	1	x	3	x	0	=	0
Timber	2	x	2	x	4	=	16
Farm	3	x	1	x	9	=	27
Village	4	x	2	x	1	=	8
City	4	x	2	x	0	=	0

Grand Total is sum
of all totals 80

Consider area of the square crossed to that which covers the largest portion of the square - ex. since ranch takes the greatest portion it should be counted as a ranch square.



The grand total would be the economic factor presented by the individual or committee proposal. Additional factors should be considered for the proposal. Space has been given on the work sheet to write out advantages and disadvantages of the route and finally a summary taking into consideration all the factors that should be presented to the planning commission. Particularly emphasis should be placed upon considering environmental factors affected by their proposal.

The students selected for the County Planning Commission have a very important role to play. They are responsible for the eventual decision of which route to use and why. While the committees are in session, it will be the responsibility of the County Planning Commission to set up a set of criteria for making a decision upon choosing the most desirable route.

The use of this game is quite flexible. The involvement of the teacher into assisting in decision making is up to the individual teacher. The maps can be colored to help identify the various areas. They can copy the color code of the master transparency or can be colored by the individual and their own key developed.

Other suggestions for use of this game would be to use the same material for locating an industrial park, a railway or any other project feasible for development.

Rancher A and B

These players represent all of the ranchers from the ranch lands A and B. The rancher from either area might have some of the following interests in the development of the highway:

- (1) How will this affect his use of the land.
- (2) What affect will the highway have on his marketing his cattle?
- (3) What types of future development might occur which would affect the rancher?
- (4) What affect will the highway development have on the natural environment.

Farmer (A,B, and C)

This player represents the farmers for area A, B or C (need 3 cards). The farmer might have some of the following interests in the development of the product.

- (1) How will the highway development affect his land value.
- (2) How will the highway development affect his market for his farm products.
- (3) What types of future development might occur which would affect his farm products.
- (4) How will the highway's development affect the farmer's taxes?

City Businessman

This player represents the businessman of the city. The businessmen might have some of the following interests in the highway development.

- (1) What new business might be developed as a result of the highway?
- (2) How might the highway affect the availability of goods in the city?
- (3) How might the highway affect the population of the city?
- (4) Will the highway cause any change in goods which might affect prices?

City Resident

This player represents the resident of the city. The resident might have some of the following interests in the highway development.

- (1) What affect will the highway development have on land values?
- (2) What affect will the highway development have on population growth?
- (3) What affect will the highway development have on taxes?
- (4) What affect will the highway development have on the appearance of the city?
- (5) What affect will the highway development have on environmental quality (air, sight, noise pollution)?

Village Businessman

This player represents the businessmen of the village. The businessmen of the village might have the following interests in the highway development.

- (1) What affect will the highway have on availability of goods?
- (2) What new businesses might be possible as a result of the highway development?
- (3) How will the highway development affect the population of the village?
- (4) Will there be a change of goods which will affect prices?

Village Resident

This player represents the residents of the village. The village resident might have some of the following interests in the highway development:

- (1) What affect will the highway have on land values?
- (2) What land will change in use and what affect will that have on the village?
- (3) Will the highway development have any affect on taxes?
- (4) What affect will the highway development have on environmental quality (air, noise, pollution)?

Timber Owner

This player represents the owner of timberland A or B. The timberland owner might have the following interests in the development of the highway:

- (1) What affect will the highway development have on the environmental quality (air, water, noise, sight pollution)?
- (2) What affect will the highway development have on population of the area?
- (3) What affect will the highway have on the use of the forest?

Environmental Protection Society

This player represents the agency of the government which has the responsibility for the welfare of the fish and game. This bureau might have some of the following interests in development of the highway.

- (1) What affect will the highway development have on the water?
- (2) Will this highway change the use demand of the lakes, rivers and game areas?
- (3) What future development or land uses might occur as a result of the highway development?

Sportsman

This player represents the sportsmen. The sportsman might have some of the following interests in the highway development.

- (1) What affect will the highway development have on the number of persons using this land?
- (2) What affect will the highway development have on habitat for wildlife?
- (3) What affect will the highway development have on the natural environment?
- (4) What future developments might occur as a result of the highway development?

County Planning Commission (3-5 members)

These players represent the decision-making body which will evaluate the proposed routes. This group will not develop its own route but rather must develop a set of criteria for evaluating the routes proposed by the committees. (These are examples and not complete -- the commission should expand these).

- (1) What affect will each route have on the natural environment?
- (2) Which route will have the most favorable costs?
- (3) Which route will benefit the greatest number of people?
- (4) What affect will each route have on possible future development?

The commission might develop a worksheet for rating each proposal so they can compare them.

Forest Service

This play represents the Forest Service Agency. The Forest Service might have some of the following interests in the development of the highway:

- (1) What effect will the highway development have on the environmental quality (air, water, noise, sight pollution)?
- (2) What effect will the highway development have on population of the area?
- (3) What effect will the highway have on the use of the forest?

Fish and Game Bureau

The player represents the agency of the government which has the responsibility for the welfare of the fish and game. This bureau might have some of the following interests in the development of the highway.

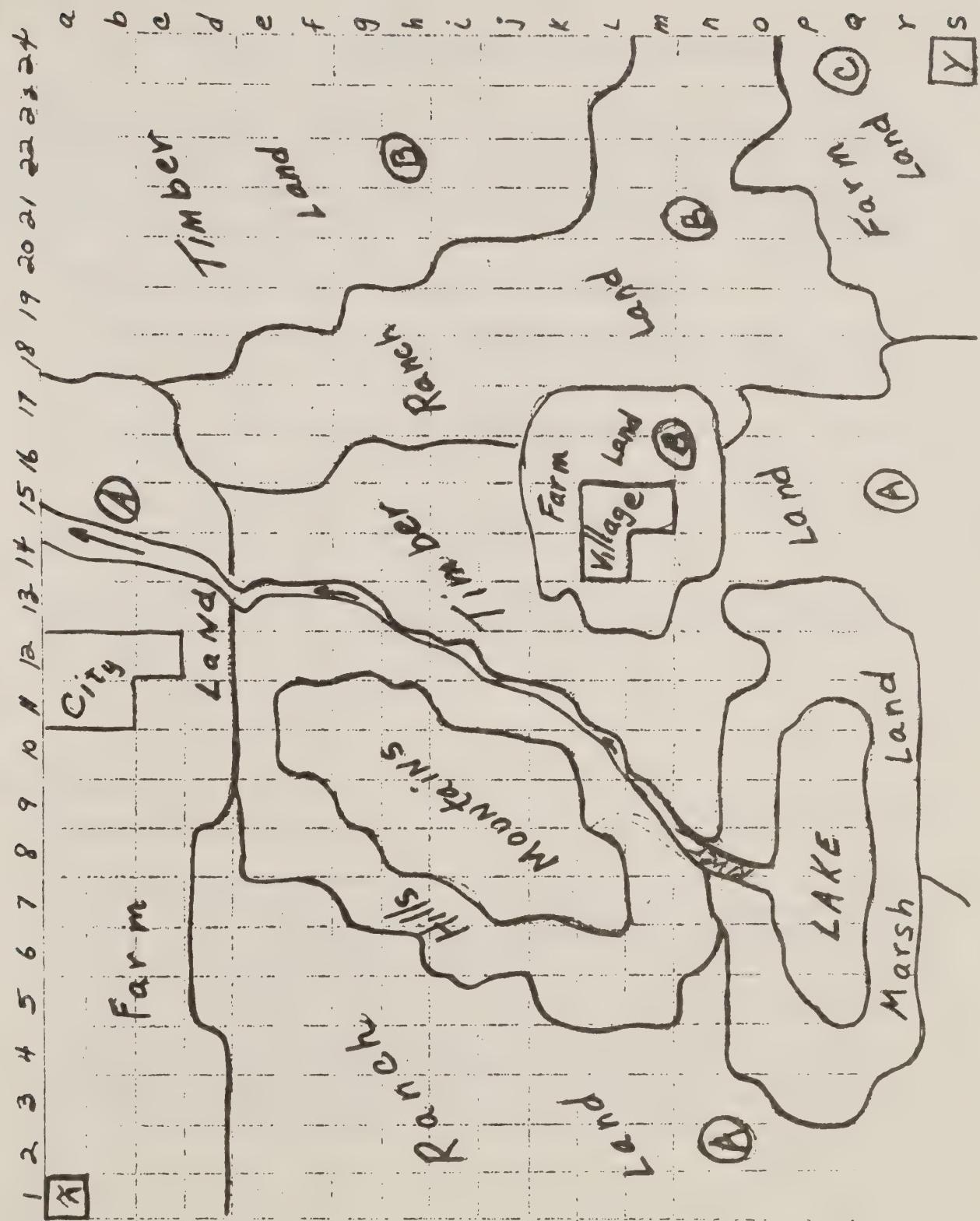
- (1) What effect will the highway development have on the water?
- (2) Will this highway change the use demand of the lakes, rivers, and game areas?
- (3) What future development or land uses might occur as a result of the highway development?

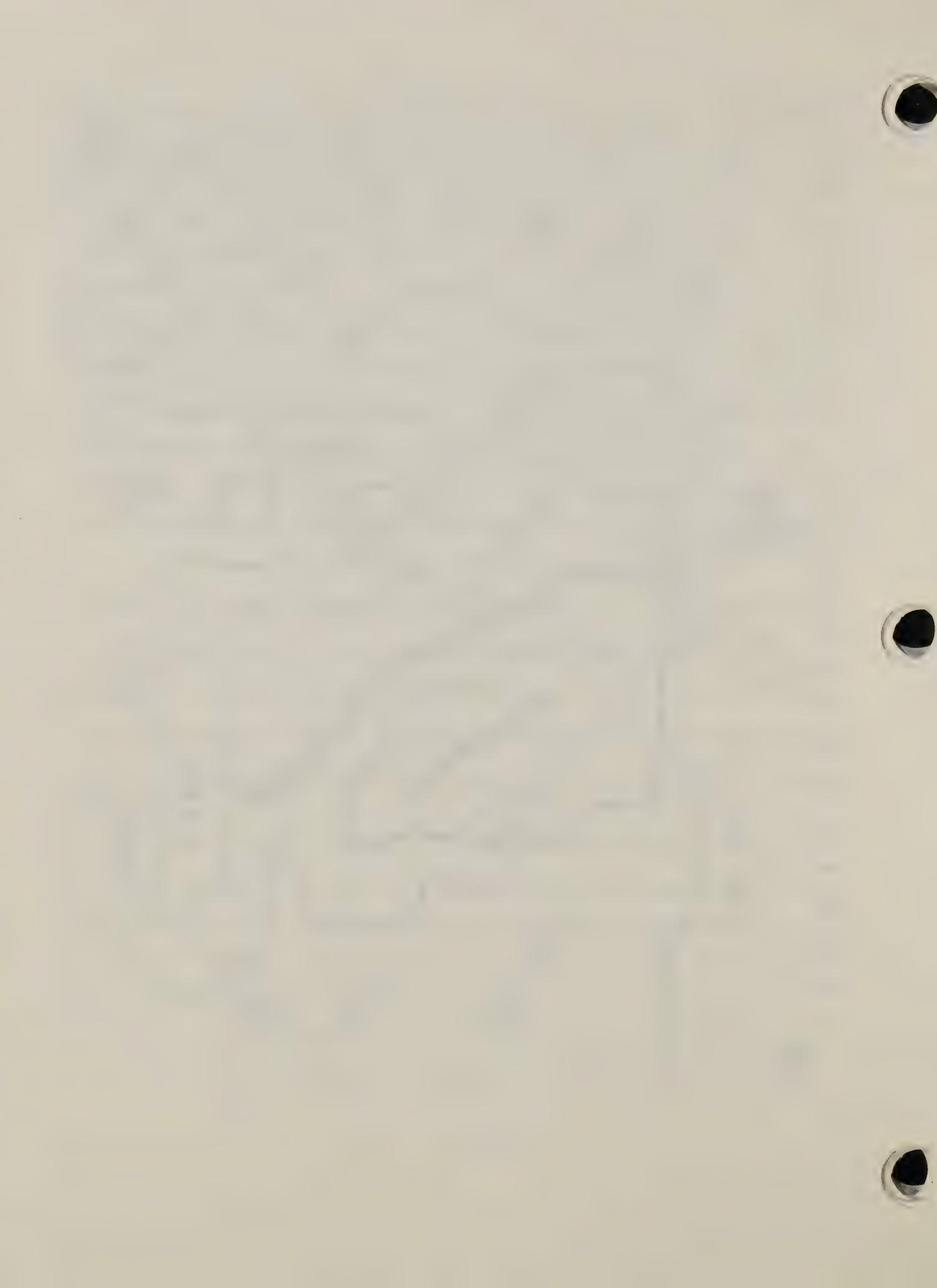
Work Sheet

Types of Land	Purchasing Cost	X	Development Cost	X	Number of Squares crossed	Total Cost
Ranch	- 1	X X	1	X		=
Mountains	- 1	X	3	X		=
Hills	- 1	X	2	X		=
Marsh	- 1	X	3	X		=
River	- 1	X	3	X		=
Timber	- 2	X	2	X		=
Farm	- 3	X	1	X		=
Village	- 4	X	2	X		=
City	- 4	X	2	X		=
*Grand Total						= _____

List advantages and disadvantages of your route below.

Reason for selection of route (consider ecology, cost, effect on future of the area), etc.





A LESSON PLAN FOR INVESTIGATING AN URBAN ENVIRONMENT

Set the stage for this investigation by reviewing quickly what will take place in the allotted time. For example: During this session we want to investigate an urban environment and collect information that will tell us about the livability, functions, needs, and problems of this community. In addition to finding out about this community, you will be developing procedures you can use with your students to investigate your own community.

I. IDENTIFYING COMPONENT PARTS OF AN URBAN ENVIRONMENT.

1. Distribute a copy of a map, of the urban area you want to investigate, to each person. (Have it large enough to make notes on when in the field.)
2. Working in small groups, list as many component parts as you can think of (TASK A).

TASK A: (20 minutes) Work in groups of 5-6.

List some things that might affect the quality of the environment in this community. (Use map and past knowledge of area.) Group and label items into categories.

Questions and discussion:

1. What categories did you come up with? (List on board just as groups report (e.g. human factors, land use, transportation, community facilities, etc.). If group listed individual items in the community, you may have to group and label into large categories (housing, commercial, utilities, transportation, land, etc.)
2. What criteria would you use in selecting an area of this community to study?
3. Have each group spend 10-15 minutes drawing boundary lines around an area they decide upon to investigate (use map passed out at first).
4. What could you do in this community to collect first-hand information about each of the categories your group decided upon?



II. CONSTRUCTING AND DEVELOPING AN INVESTIGATION

TASK B: (60 minutes)

Develop a plan of action to investigate your part of the urban environment. Consider such things as how to divide responsibility for collecting information, what information to collect, will you stay together or split up, most efficient ways to collect and record information, develop tools to record information.

NOTE: Information in TASK B should show relationships between items from the inventory, cause and effect relationships, conflicts and complements, information should show specifics or details which help explain or clarify a relationship. Methods may include: questioning, opinion polls from residents, user counts of facilities, traffic counts, maps in greater detail, etc.

Each group give brief outline of procedure for their planned investigation of the _____ community.

III. COLLECTING, RECORDING, AND REPORTING SURVEY INFORMATION.

TASK C: (3-4 hours) Field investigation.

Each group spend 3-4 hours to do a visual survey and investigation of that portion of the community decided upon, using the methods of collecting, recording and interpreting data each group developed.

TASK D: (5 minutes, each group) After return from field investigation.

Plan a 5-minute report that tells and shows the methods you used and the information collected in TASK C. The report must use the following criteria:

- a. Use more than one person as spokesman.
- b. Use visual displays.
- c. Include a variety of information media and methods of getting it.
- d. 5-minute time limit.
- e. Consider--what you did, how you did it, what it meant.

Questions and discussion:

1. What are some component parts of the environment that you just investigated? (List on board) e.g. roads, homes, business, river, recreation.
2. In what ways are the component parts interrelated? e.g. transportation to business, buildings to public utilities, transportation to land forms, strip city development to transportation, etc.
3. How does each part of the community investigated relate to the other areas? To the total community?
4. What would happen if one whole segment of the community were eliminated? One category?
5. What are some "focus words" (Themes) that could be used to further study this area? (change, repetition, continuity, interdependence, etc.)
6. What examples are there in your area that:
illustrate the past--
typify the present--
indicate the future--
7. What are your recommendations for meeting future needs in this area?
8. If you were the city planning commission, what guidelines would you develop for consideration of future developments in this area?
 - a.
 - b.
 - c.
9. Identify three factors that affect the quality of your area.

IV. IDENTIFYING AND CONSTRUCTING AN INVESTIGATION OF ONE ENVIRONMENTAL PROBLEM.

Let's take an example of one interrelationship and investigate one segment of it.

(Note: Pick one example such as transportation--traffic congestion and have group list items under the following three columns, one column at a time.)

<u>What we want to find out about the interrelationship</u>	<u>How to collect the information</u>	<u>How to record information</u>
e.g.: (How many cars Where they go Where come from)	(survey-visual count, questionnaire questionnaire)	(graph description map location)

TASK E: (30 minutes) Work in original small groups.

Select one interrelationship or problem that you identified and develop an in-depth investigation to find out more about it. Consider: What you need to find out about it, actual samples of how to collect and record information, cause-effect relationship, alternative solutions to the problem, where to collect additional data, what social and political decision-making processes are available.

NOTE: If this whole lesson is done over an extended period of time, then each group should be allowed to carry out their investigation.

Questions and discussion:

1. Have each group make a report covering points in TASK E.
2. Now that we know more about the _____ community, do TASK F.

TASK F: (15 minutes) Small groups.

List what you can say about your study area in relation to its: (consider past, present, future)

Functions

Problems

Needs

Questions:

1. What are the basic functions of your study area? Whole community?
2. What are some of the most obvious problems?
3. What are some of the needs of the study area?
4. Identify three factors that affect the quality of the environment in your area.
5. What impact does this survey area have on the management of your community?
6. What additional information would you like to have had before making a decision? (e.g. see question 12 after TASK C in Land Use Simulation Game lesson plan.)

V. COMMUNICATING FEELINGS, AWARENESS, AND VALUES.

TASK G:

Describe what you would do to solve or improve the problem you identified in TASK E--

as a member of a community action group--

as a part of the political decision-making process in your community.

Questions and discussion:

1. Discuss individual comments.
2. What type of community action can we take to identify and motivate people to collect, interpret data, arrive at alternative solutions and take intelligent action to decide on the best solution consistent with the needs of the environment and society.

Summary Questions:

1. What did we find out about the environment in our study?
2. How can we summarize our discussion and investigations?
3. What processes and methods did we use in our investigation today?

TASK H

Describe in writing how you feel about our session today.

BEHAVIORAL OUTCOMES IN KNOWLEDGE

As a result of these activities, you should be able to:

Identify at least three factors that affect the quality of the environment.

Describe a procedure to use in initiating an environmental investigation that can take place in any urban environment.

Identify at least three component parts of an urban environment.

Describe four interrelationships that exist between component parts of the environment.

BEHAVIORAL OUTCOMES IN FEELINGS, AWARENESS, VALUES, AND ACTION

As a result of these activities, you should be able to:

Describe what you can do to become involved in community action programs of identifying and suggesting solutions to local environmental problems.

Describe how you and the community people can become involved in affecting the local political decision-making process through environmental urban investigations.

Analyze the cause and effect relationships of factors affecting the quality of the environment. (This is prerequisite to any positive change.)

Identify forces and change agents that can be used for or against an improved livability of the area.

Equipment needed

Enlarged maps of the urban area to be investigated

Blackboard or newsprint easel

Magic markers or chalk

Paper and pencils

ADDITIONAL INFORMATION

The following laboratory sheets could be used to provide additional information to people investigating an urban environment after they have completed TASK's A, B, and C. The group may identify different component parts of the environment than those listed here.

LAND USE SURVEY

1. Inventory and plot on map

List the major uses of land in the area.
Group these uses into appropriate categories.
Label the categories.
Develop a legend for plotting this data on the map

2. Additional Information

DEVISE YOUR OWN METHODS TO COLLECT AND RECORD THIS DATA.
SUBMIT THE METHODS AND THE DATA, IN WRITING, TO YOUR GROUP LEADER AT THE
END OF THE SESSION.

How does each land use affect the other land uses of the area?

What problems exist because of certain land uses?

What land use problems in this area are related to regional (Portland metropolitan area) environmental problems?

What things are being done to the land that are compatible with:
the characteristics of the land?
the needs of the people?

Which land uses are changing?

What proposed projects could affect land use patterns in this area?

NOTE: The above questions are designed to help you look for significant relationships between things in the environment. Time may not allow you to investigate all of the suggestions. Therefore, you will have to decide which things are most significant in the time allowed. Please feel free to add to the list, throw it away and start all over, etc.

Something to think about

For each of the land uses you investigate, ask yourself:
Is it in a good location to serve its purpose?
What does it do to the environment?
What kind of an environment does it have?

3. Summary questions on land use survey

See questions and discussions after TASK D.

TRAFFIC AND TRANSPORTATION SURVEY

1. Inventory and plot on map

List the major traffic routes in the area.
Group these routes into appropriate categories.
Label the categories.
Develop a legend for plotting this data on the map.

2. Additional information

DEVISE YOUR OWN METHODS TO COLLECT AND RECORD THIS DATA.
SUBMIT THE METHODS AND THE DATA, IN WRITING, TO YOUR GROUP LEADER AT THE
END OF THE SESSION.

List the major user groups of each category in #1.

Which are the most heavily traveled routes?

What problems are associated with traffic and transportation in the area?

What is the effect of these problems on the rest of the study area?

What traffic and transportation problems associated with this area are related to regional (Portland metropolitan area) environmental problems?

What proposed projects could affect traffic and transportation patterns in the area?

NOTE: The above questions are designed to help you look for significant relationships between things in the environment. Time may not allow you to investigate all of the suggestions. Therefore, you will have to decide which things are most significant in the time allowed. Please feel free to add to the list, throw it away and start all over, etc.

Something to think about

For each of the traffic and transportation routes you investigate, ask yourself:

Is it in a good location to serve its purpose?

What does it do to the environment?

What kind of an environment does it have?

3. Summary questions on traffic and transportation survey

See questions and discussions after TASK D.

COMMUNITY FACILITIES AND SERVICES SURVEY

1. Inventory and plot on map

List the community facilities and services in this area.
Group these facilities and services into appropriate categories.
Label the categories.
Develop a legend for plotting this data on the map.

2. Additional information

DEVISE YOUR OWN METHODS TO COLLECT AND RECORD THIS DATA.
SUBMIT THE METHODS AND THE DATA, IN WRITING, TO YOUR GROUP LEADER AT THE
END OF THE SESSION.

List the user groups for each category in #1.

What reasons can you give for the locations of each of the community facilities and services you listed in #1?

What needs of the people are being met by these facilities and services?

What needs are not being met by existing facilities and services?

What problems are associated with the quantity and quality of community facilities and services in this area?

Which of these problems are related to regional (Portland metropolitan area) environmental problems?

What proposed projects could affect the use and effectiveness of community facilities and services in this area?

NOTE: The above questions are designed to help you look for significant relationships between things in the environment. Time may not allow you to investigate all of the suggestions. Therefore, you will have to decide which things are most significant in the time allowed. Please feel free to add to the list, throw it away and start all over, etc.

Something to think about

For each of the community facilities and services you investigate, ask yourself:

Is it in a good location to serve its purpose?

What does it do to the environment?

What kind of an environment does it have?

3. Summary questions on community facilities and services

See questions and discussions after TASK D.

ENVIRONMENTAL ASSETS AND LIABILITIES SURVEY

1. Inventory and plot on map

List the environmental assets of the area. (physical and visual)

Examples:

historic landmarks, visual impact structures, natural features, aesthetically pleasing entrances, etc.

List the environmental liabilities of the area (physical and visual)

Examples:

conflicting land uses, high traffic streets, residential overcrowding, poor paving, curbs, sidewalks, adverse natural features, sameness of environment, etc.

Group the environmental assets and liabilities into appropriate categories.

Label the categories.

Develop a legend for plotting this data on the map.

2. Additional information

DEVISE YOUR OWN METHODS TO COLLECT AND RECORD THIS DATA.

SUBMIT THE METHODS AND THE DATA, IN WRITING, TO YOUR GROUP LEADER AT THE END OF THE SESSION.

How do the environmental assets affect the rest of the area? (be specific)

How do the environmental liabilities affect the rest of the area? (be specific)

Which environmental assets have potential for serving as building blocks to improving the liveability of this area?

What problems exist because of adverse environmental factors in the area?

What environmental problems in this area are related to regional (Portland metropolitan area) environmental problems?

What proposed projects could affect environmental assets and liabilities in this area?

NOTE: The above questions are designed to help you look for significant relationships between things in the environment. Time may not allow you to investigate all of the suggestions. Therefore, you will have to decide which things are most significant in the time allowed. Please feel free to add to the list, throw it away and start all over, etc.

Something to think about

For each of the environmental assets and liabilities you investigate, ask yourself:

Is it in a good location to serve its purpose?

What does it do to the environment?

What kind of an environment does it have?

3. Summary questions on environmental assets and liabilities

See questions and discussions after TASK D.

SOCIAL SURVEY

1. Inventory and plot on map

Collect information about the population characteristics of the area.
Age, income, education, size of families, renters-owners, length of residence, etc.

Develop a legend for plotting this data on the map

2. Additional information

DEVISE YOUR OWN METHODS TO COLLECT AND RECORD THIS DATA.
SUBMIT THE METHODS AND THE DATA, IN WRITING, TO YOUR GROUP LEADER AT THE END OF THE SESSION.

What needs of the residents are met by living in this area?

What social problems exist in the area?

Which problems associated with this area are related to regional (Portland metropolitan area) environmental problems?

What changing conditions in the area are creating problems for its residents?

What proposed projects could:

affect the life-style of people in this area?

lead to a change in the population characteristics of this area?

What are the attitudes of the people in this area toward:

governmental and private services

citizen needs

overall quality of life in the area? (See attached opinion poll)
(questionnaire)

NOTE: The above questions are designed to help you look for significant relationships between things in the environment. Time may not allow you to investigate all of the suggestions. Therefore, you will have to decide which things are most significant in the time allowed.
Please feel free to add to the list, throw it away and start all over, etc.

Summary questions on social survey

Questions and discussions after TASK D.

SOCIAL SURVEY QUESTIONNAIRE

Note to person administering questionnaire:

Fill in the blanks with appropriate words, depending on the location and the purposes for which you are using the questionnaire.

1. I live in _____ at (cross-streets) _____.

2. Overall, _____ (shop)
as a place to (live) is:

____ VERY GOOD ____ QUITE GOOD ____ JUST FAIR ____ POOR ____ VERY POOR

3. What I like best about _____ is:

4. My biggest complaint about _____ is:

5. Here's what I think should be done about that:

MICRO-URBAN INVESTIGATIONS

In addition to major component parts or categories of an urban environment, there are many opportunities for small individual environmental investigations.

Investigations of this nature should be developed in writing along the same procedures as in TASK B, C, or E.

TASK _____

Develop in writing an investigation about some part of the man-made environment.

- a. Describe procedures in action or process terms.
- b. State objectives in behavioral outcomes that indicate some minimal expectations in acquiring new knowledge and skills.

Here are some suggested micro-urban environmental investigations:

1. Correlation of observable weather conditions to air pollution index.
2. Correlation of man-made sounds to noise pollution.
3. Effect of signs and billboards on sight pollution.
4. Effect of architecture on aesthetics.
5. Impact of local shopping center on community.
6. Supermarket Survey (packaging, buying habits).
7. Interpreting the man-made landscape using architectural styles, etc.
8. Observe and record life in a park.
9. Man's effect on watersheds through paving.
10. Under what conditions can plant life live in a blacktop environment.
11. Compare city downtown block to a residential block.
12. Determine the different responses of water holding capacity and runoff to different types of man-made surfaces.
13. Environment of a city tree.
14. Determine what is in a city block.
15. Noise pollution (Determine where noises occur most frequently and determine city noises which can be reduced to minimize noise pollution).
16. An analysis of traffic past a given point.
17. Inventory and classify historic structures within the central business district of your hometown and determine necessities for their protection.
18. What will the effect of a four-day work week be on the community environment?
19. Does storm runoff from city streets contribute to water pollution?
20. Identifying factors and developing tools to help in recording and interpreting air pollution indexes in the local community.

This lesson was developed for use in teacher workshops by Charline McDonald, Portland, Oregon.

The lesson plan was revised in November 1971. It is suggested by the writer that continuous revision take place by people who use the ideas.



DEVELOPING ENVIRONMENTAL INVESTIGATIONS

An environmental investigation should be designed so that all participants can take an active part at their own level of ability and interest.

The investigation should have opportunities for the participant to make observations, collect and record data, make some type of interpretation of data and summarization of how those interpretations relate to the topic.

The following chapters are designed to give the participant some experiences to construct an environmental investigation.

I. Introduction (page 2)

Teaching Process Skills

Survival Values in Learning

A major goal of teaching process skills is to develop the ability for each person to think for himself.

II. Developing Task Cards (page 4) - 3 hours.

Task cards can promote small groups and individual investigations with a minimum of teacher direction.

III. Using Questions in Environmental Investigation (page 9) - 1 hour.

The use of certain kinds of questions can help establish a learning climate that will encourage participation, discussion and interaction during the investigation.

IV. A Basic Question Sequence for the Interpretation of Data Process (page 14) 2 hours.

This question sequence can allow the group to interpret their own observations and recorded data about the topic.

V. Developing a Lesson Plan for an Environmental Investigation (page 19) - 1½ hours. If you put all the above pieces together you can come up with the start of a lesson plan for an environmental investigation.

VI. Miscellaneous (Reading) - (page 21)

Behavioral Outcomes

Criteria To Evaluate Objectives

Action Words and Behavioral Terms

Hierarchy of Process

Data Collecting Guidelines For
Environmental Problem Solving



I. INTRODUCTION

Teaching Process Skills

A major goal of teaching process skills is to develop the ability within each individual learner to function autonomously at the inquiry and proof level; i.e., the ability to obtain, organize, translate, interpret and apply bodies of knowledge, and to present proof of the validity of the process.

Have group do TASK A--Survival Values in Learning Chart

1. In groups of 3-4 discuss the chart and answer the 2 questions at the bottom.
2. Have groups share their ideas about the implication of the chart.

Some Implications about the Chart: Survival Values in Learning

This chart relates to what you learn, not in comparison to how you learn it.

The lasting or survival value of learning some things may not be a very productive use of our time. According to the chart we only remember about 35% of the facts and 50% of the conceptual schemes shoved at us after only 3 months.

We retain the ability to manipulate and operate things (machines, tie shoes, write, etc.) up to 70% of the learning experience. If the learning experience were designed for us to develop thinking skills and processes (gather, sort, analyzing, interpret and provide alternate solutions about problems) we could retain those skills at the 80% level of usefulness.

Therefore, we might assume that a person who has developed the ability to think for himself can collect and analyze factual data, develop a line of reasoning or contribute to the interpretation or solution of a problem or decision. Many times the learning experience deals only with memorizing facts and other information or concepts with no chance for putting that knowledge to work for us.

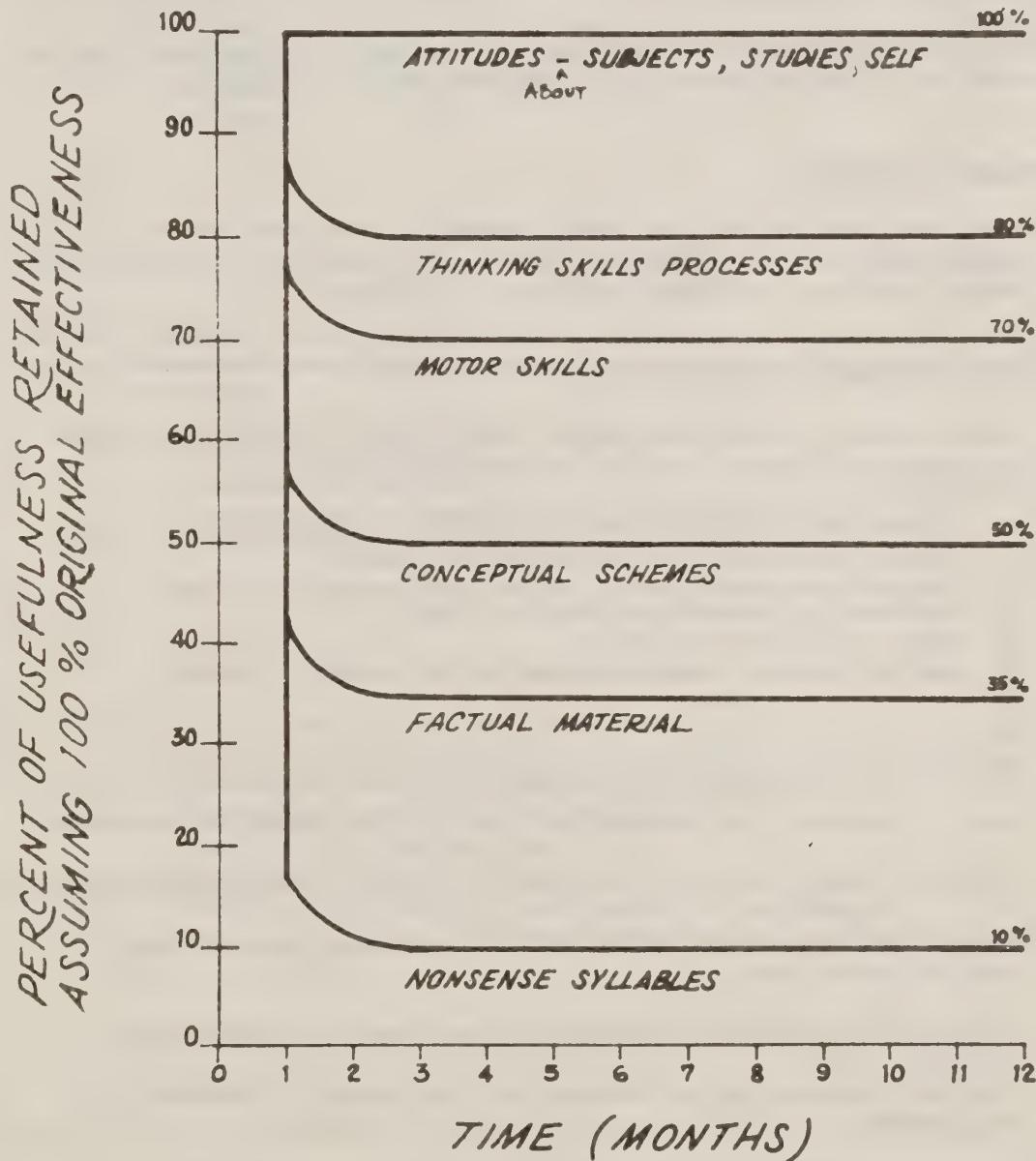
Before planning a workshop and other learning experiences, ask yourself--

1. What am I doing this for?
To help people memorize facts, learn concepts or to think for themselves?
2. How can I structure learning experiences to insure participation and the development of thinking processes along with the use of factual data, etc.?

We are now recognizing that if we develop thinking skills and processes of investigation, we may begin to change behaviors. Only by actually involving people in environmental learning experiences can they begin to think about their role in environmental management. We must be concerned with developing environmentally literate persons who can think for themselves.

Survival Values in Learning

Used in the Higher Level Thinking Ability Course - N.W.E.R.L. - as an interpretation from Educational Psychology, Cronbach Harcourt Brace & World 1963.



This chart shows the retention rate of different categories of learning. In small groups discuss and answer the following questions.

What does this chart say about the retention of learning?

What are the implications of this chart to the way we plan learning experiences?

II. DEVELOPING TASK CARDS

In developing an Environmental Investigation Lesson Plan, self-directed task cards can be a useful tool. They can promote individual and small groups data-collecting and interpretation.

Task cards are not new and have been used in many ways. A task card can be simply a card on which you write the directions for a learning experience.

Questions and discussions

1. Pass out examples of task cards. Example: Use examples of Investigating your Environment Task cards, Milwaukie School District cards, American Geological Institute, ("Essence")

Task A (30 minutes) (groups 4-6)

After looking at the task cards, that you have, list some reasons for using this method as one instructional help.
Examples:

1. allows for different levels of ability to participate at once.
2. easily adjustable--can add or delete tasks
3. can promote small groups interaction and accomplishment
4. teachers do preparation ahead of time
5. don't feel bound to manual
6. can tailor-make investigations to fit needs of students
- 7.
- 8.
- 9.

2. Make a composite list on the basis of all the groups contributions.
3. Point out that task cards can also have the following characteristics:

Sequential, programmed, assorted, self-directed, personalized, task oriented, etc.

Provide for a variety of kinds of--involvement, communication, feedback.

Provide alternatives and choices for the learner--laminated for wet weather.

4. Ask the group if they can think of any other characteristics.
5. Have groups do Task B.

TASK B (30 minutes) (groups 4-6)

List other topics for task card ideas in the following grades.

Suggested assortment as samples:

Kindergarten - Primary (K-3)

Assorted topics based on observation, using the senses--
sense of touch
shapes
colors
sounds

Intermediate grades (4-6)

Assorted topics based on schoolyard and curriculum enrichment activities--
developing observations (same as above)
language expression
schoolyard land use
how-you-feel-about-the-schoolyard-type-activities
science-on-the-schoolyard-type-activities

Non-graded (could be for any level to adults)

Assorted topics following an environmental action approach--
developing and conducting a litter campaign
inventory sources of Air Pollution
improve your neighborhood
consumer studies
observe and interpret some aspect of management
(wildlife habitat, timber management, stream survey, etc.)

6. List additional (on the board) ideas for each category, in Task B, from the groups. (If time allows.)

TASK C (15 minutes) (small groups)

Using the following criteria, evaluate the sample task cards below:

1. Does the activity actually involve the learner in the environment? How?
2. Is the activity relevant to the learner in his world? (age level, topic, etc.)
3. Does the activity include opportunities for problem solving?
4. Does the activity include opportunities for the learner to collect and record data based on his own observations?
5. Does the activity include opportunities for the learner to make his own interpretations about the data he collects?

SAMPLE TASK CARDS

(From an assortment of task cards for a nature trail walk)

Here are two leaves.
Make a list of all the similarities you find.
Make a list of all the differences you find.
(Staple leaf here) (Staple leaf here)
Leaf 1 Leaf 2
Similarities:
Differences:

Circle the # for the criteria present on card

1
2
3
4
5

(From a sequence of task cards on "Sounds")

Find a noisy place and stay there for a little while.
How do you feel in a noisy place?
Write a few sentences or a poem to tell how the noisy place makes you feel.

1
2
3
4
5

(From a sequence of task cards on "Spaces")

Walk around your classroom.
How do you feel in this space?
Write or tell about how it makes you feel.

Go outside and stand near the school building.
Do you feel different here than you do inside?
Write or tell how this space makes you feel.

1
2
3
4
5

(From a unit of study for a "Supermarket Survey")

In your backyard or schoolyard, bury different kinds of packaging materials. Dig them up at specified intervals of time and compare decomposition rates.

1
2
3
4
5

	Alum. Can	Glass Bottle	Plastic	Cardboard	Etc.
Sept.					
Oct.					
Nov.					
Etc.					

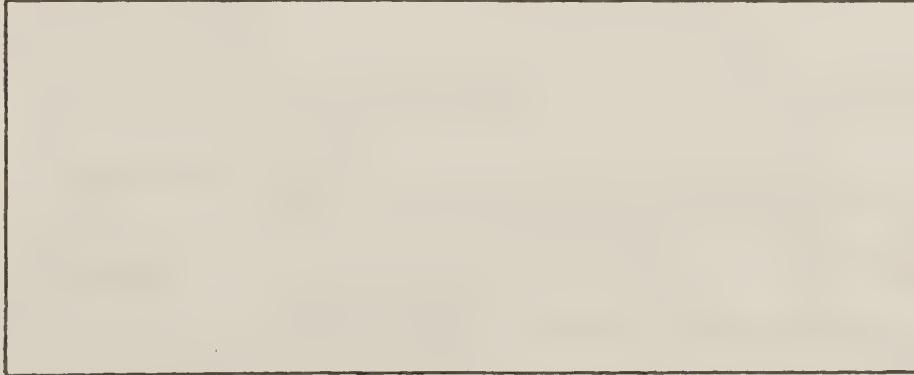
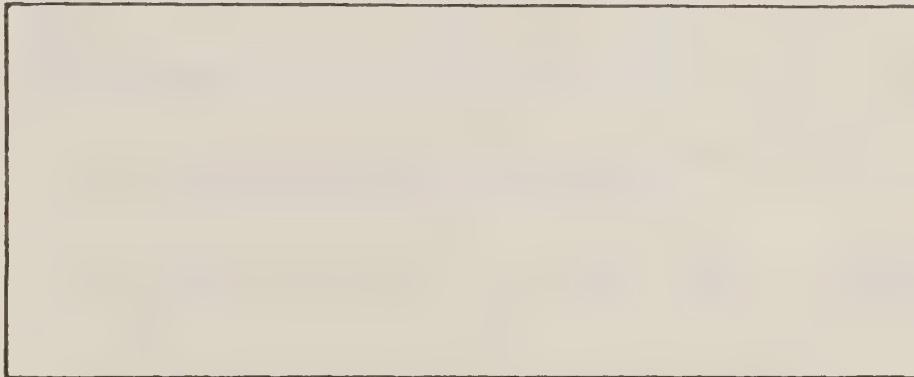
TASK D

In small groups (3-4) construct at least two task cards on a topic of your choice.

Some suggested Instructions for Cards:

select a topic or theme or a particular environment
decide on your purposes
select some activities to accomplish those purposes
construct task cards below about the topic or theme you chose
consider including a variety of-types of involvement
-sizes of groups
-lengths of time
-methods of recording or
communicating information

When you finish, evaluate another groups' task cards using the criteria from TASK C.

**Questions and Discussion**

1. Have several articles of one page in length on environmental problems such as noise pollution, resource management, etc., and have small groups develop task card investigations from the article that meets some of the criteria from Task C.

2. Now that you have examined and constructed several task cards, what guidelines would you write for another group of teachers to use in developing task cards?

Some example responses:

- a. have one specific goal
- b. keep task brief enough to maintain interest and sequence
- c. color code them by areas of study or ability
- d. keep directions simple
- e. should fit within a time limit
- f. some form of self-evaluation statement
- g. use processes of observing, collecting, recording, and interpreting data

III. USING QUESTIONS IN ENVIRONMENTAL INVESTIGATIONS

One objective in learning is to help people develop thinking skills and processes that will allow them to interpret the data they collect. A good discussion and a good learning experience will happen if appropriate questions are asked. The use of certain kinds of questions can help establish a learning climate that will encourage individual participation, group interaction, and interpretation of the information collected in the investigation.

1. Ask each of the four questions below. Have each person write down as many things they can think of after each question. After they have written their answers to each question, ask how they felt about answering that question. Discuss.

What would happen if the rainfall doubled in your state next year?

How many acres of land in your state?

Why are recreation lands in your state important?

What are some things you think should be done in Environmental Education in your state?

2. Pass out TASK A (below)

TASK A (15 minutes)

Get into groups of 3-4 and answer the following questions about the four questions that were asked of you.

- a) Which of the four questions below did you feel most comfortable answering?
1 2 3 4 Why?
- b) Which question did you feel least comfortable answering?
1 2 3 4 Why?
- c) Which question allowed for greatest participation?
1 2 3 4 Why?

Questions asked:

Question #1 - What would happen if the rainfall doubled in your state next year?

Question #2 - How many acres of land in your state?
(What is the highest mountain in the United States?)

Question #3 - Why are recreation lands in your state important to the economy?
(What are the reasons for the location of major city?)

Question #4 - What are some things you think should be done in Environmental Education in your state?
(In your opinion, what is the major problem facing the environment today? Tell why.)

3. Ask for verbal answers and discussions from the total group about TASK A.
4. The following is background information on the questions in TASK A. You may want to read it, or summarize it according to how the group discussion goes.

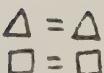
Some people think that if you just ask questions, your problems are solved as far as getting involvement and group interaction. Asking questions doesn't necessarily insure more participation, better interaction, or higher levels of thought processes. The kinds of questions you ask and when you ask them is important. As you can see from TASK A, different kinds of questions get different kinds of responses.



Question 1 - What would happen if the rainfall doubled in your state next year?

This divergent type of question provides the opportunity to consider many different systems and try out many answers.

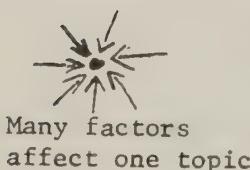
If you ask a question that asks for a wide variety of responses, you'll probably get a wide variety of responses and the participation will be more free. This allows more opportunity for creativity and imagination. (What would happen if.....? How might.....? What do you see.....?)



Question 2 - How many acres of land in your state?

This memory type question calls for remembered content, rote memory, or selective recall.

If you ask a question that has one correct answer, then people will go after the correct answer or the answer they think the leader is looking for. The kind of thinking that is going on is the recall of previously learned information and facts. (Who is.....?, What is.....?)

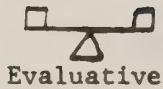


Question 3 - Why are recreation lands in your state important to the economy?

This convergent type question represents the analysis of given or remembered information. It leads to one expected end result or answer.

If you ask a question that focuses on solving a problem or putting several pieces of data together, then the audience has to reason, using given or remembered data. (Why are these things so.....? How do you account for.....?)

The participant becomes a problem-solver in which the task is to apply the proper operations at the proper time.



Question 4 - What are some things you think should be done in Environmental Education in your state?

This evaluative type question asks the participator to use judgment, value, and choice, and is characterized by its judgmental quality.

The type of question you ask then, can affect the learning atmosphere and restrict or motivate the participants to become involved in the discussion.

5. Have Group do TASK B

- a) Which questions are similar? (Not in their content, but in the kind of responses they would receive)
- b) Put the questions that are similar into groups.
- c) Label (give name to) each grouping of questions.
- d) Use these labels to fill in the first column on the following chart.
- e) Complete the chart.

TASK B (30 minutes)

1. In groups of 3-4, identify the following questions that are similar. (similar in the kinds of responses they would receive, not in the content)
 - a. What is a nuclear reactor?
 - b. Why are the demands for energy doubling every 10 years in the U.S.?
 - c. How do you account for the decreasing amount of open space in your community?
 - d. What do you think is the best use of this land?
 - e. Name the largest city in your state?
 - f. Should numbers of coyotes be controlled? Why or why not?
 - g. What would happen if all automobiles were banned within the Seattle city limits?
 - h. How much land has been taken out of agricultural production in the U.S. in the last 5 years?
 - i. What effect do trees and shrubs have on noise abatement?
 - j. What factors contribute to the traffic congestion problem in your community?
 - k. In your opinion, what are the 3 most important problems in your community?
 - l.
2. Put the numbers or letters that represent each group identified in the chart below and label each group.

<u>Groups</u>	<u>Label each group of questions using your own names</u>

3. Put your labels in the chart below and describe your groupings.

<u>Kinds of Questions (use the names you gave the groupings)</u>	<u>Characteristics of questions in this group</u>
What does your chart tell you about the use of questions? 1. 2. 3.	

Questions and Discussion:

1. Discuss TASK B and particularly--What does your chart tell you about the use of questions? Ask different groups what ideas they come up with.
2. Here are some ideas to add to the groups comments:

The kind of questions you ask affects the involvement level and atmosphere (bored, stuffy, uncomfortable, excited).

The type of questions you ask can affect the number and type of responses you get from a group.

Different types of questions can be used at different times in the course of a discussion.

The kind of thinking that takes place can be affected by the kinds of questions being asked.

The level of discussion within the group can be affected by the kinds and sequence of questions being asked.

If you are aware of the difference in the kinds of questions, you can do a better job of analyzing the responses.

Good discussions don't happen by accident.

3. Let's explore a basic question sequence usable as a part of Environmental Investigation.

(See -- A BASIC QUESTION SEQUENCE FOR THE INTERPRETATION OF DATA PROCESS)

IV. A BASIC QUESTION SEQUENCE FOR THE INTERPRETATION OF DATA PROCESS

It can be important to develop a basic question sequence to allow people to interpret their own observations in the interpretation of data process.

There are four basic question categories that can be used in this process. Select a topic (common to all) about which they should write the questions. It could be something in the immediate area or room.

1. Open Questions

Designed to provide an opportunity for all persons to participate and to obtain a body of specific data which will provide the opportunity to focus on significant points.

This type of question provides an opportunity for every person to become immediately involved in the discussion, regardless of his ability or background. It is completely free of the element of "guess what's on my mind."

THE CHARACTERISTIC OF THIS QUESTION IS OPENNESS

"What do you see as you look at the hillside?"

"What did you see on your walk in the city?"

"What do you notice about the soil profile?"

List two open questions that you would use to allow as many people as possible participate in a discussion:

Note: Interpretation of data may not necessarily begin with an open type question. You may wish to focus immediately upon specific points in the data. In that case, begin the question sequence with a focus question.

2. Focusing Questions

The focusing question is an extremely important element in the interpretation of data process. It focuses on specific points that will later be compared, contrasted, and related to other points.

Its basic purpose is to focus the attention on specific data as a central point for discussion.

THE CHARACTERISTIC OF THIS QUESTION IS SPECIFICITY

"What are some things that are helping the log decay?"

"What are some things that affect the quality of water?"

"What are some possible reasons for this change?"

List two focus questions that you would use to focus in on a specific point for discussion.

3. Interpretive Questions

Designed to compare, contrast, and seek logical relationships between the specific points brought out in the focus question(s).

The learner is asked to compare and contrast two or more specific points in the data; two or more groups of data; two or more feelings, concepts, or ideas, and express a perceived or inferred relationship between them.

THE CHARACTERISTIC OF THIS QUESTION IS ITS FOCUS ON RELATIONSHIPS

"Are there any of these that seem to belong together?"

"What can we say about the PH of water from the aquatic life found there?"

"How do you account for the differences between these two areas?"

"Why were the two trees the same age but different in size?"

List two interpretive questions that you would use to seek relationship between specific points.

4. Capstone Questions

Designed to obtain conclusion, summary, close.

It occurs at the close of a particular discussion and calls for a statement which summarizes in a generalized form what has been discussed so the generalization or big idea applies to a variety of situations. It calls for a conclusion, generalization, or summary.

THE CHARACTERISTIC OF THE CAPSTONE QUESTION IS ITS CONCLUSIVENESS

"How could we summarize on discussion about architecture?"

"Based on our observation and discussion, what can we say about water environments?"

List two questions you would use in summarizing or closing a discussion.

Questions and Discussion:

1. Get into groups of 4-6 and do Task A.
2. Ask for examples groups have come up with.
Discuss--ask if it fits criteria listed on Task A.

TASK A (15 minutes)

In small groups (4-6) write down two examples of each of the four major question categories you have been asked in field investigation sessions so far.

OPEN (allow everyone to participate. Get out a lot of data)

1.

2.

FOCUS (focus attention on specific data as a central point for discussion)

1.

2.

INTERPRETIVE (seeks relationships--compare, contrast, relate specific points in the data)

1.

2.

CAPSTONE (calls for a statement which summarizes what has been discussed)

1.

2.

Questions and Discussion:

1. Show film--(Environmental Awareness--11 minutes)
2. Involve the audience in discussing the film using one of the following question sequences.

Examples of Two Question Sequence
for
The Environmental Awareness Film

Here are three sets fo questions for a discussion leader's use in helping people discuss their thoughts about their environment.

- a. Purpose: To explore different implications of the word "environment."
 - What did you see in the film?
 - What were the different kinds of environments shown in the painting?
 - What were some of the things that were similar in each environment?
 - What does the word "environment" mean?

- b. Purpose: To explore some effects of change in the environment.
 - What did you see in the film?
 - What were there changes in the environments in the film?
 - What things were affected by changes in the environment?
 - How can we summarize our discussion about change in the environment?

- 3. Pass out Task B and have the audience identify, list and discuss the four major question categories just used in discussing the film.

TASK B

Identify, list and discuss the four major questions used to discuss the film.

QUESTIONS (List four major questions asked by leader)	Film	State PURPOSE of each question
1. 1.		
2.		
3.		
4.		

DEVELOPING YOUR OWN QUESTION SEQUENCE FOR INTERPRETATION OF DATA PROCESS

1. Show another short film (eg., Tree House, Sparkle, Garbage)
2. After film pass out Task C and have each group write a question sequence.

TASK C (20 minutes)

Working in groups of 3, construct a purpose and question sequence to use in discussion of the film just seen.

CRITERIA TO EVALUATE INTERPRETATION OF DATA QUESTIONS

- Open - Allow everyone to participate. Get out allot of data.
- Focus - Focus attention on specific data as a central point for discussion.
- Interpretation - Seeks relationship. Compare, contrast, relate specific points in the data.
- Capstone - Calls for a statement which summarizes what has been discussed.

Film

Purpose of showing and discussing film: _____

Open question: _____

Focus: _____

Interpretive: _____

Capstone: _____

(Questions must relate to the purpose of discussing the film on whatever the subject is)

3. Have each group share and evaluate their question sequence with another group. (30 minutes)

V. DEVELOPING A LESSON PLAN FOR AN ENVIRONMENTAL INVESTIGATION

Working in groups of three, select one thing on this site to develop an Environmental Investigation about.

Group members: _____

Purpose of Investigation: _____

Evaluation: Is the purpose clearly defined? Yes No
Is it too general to be workable? Yes No

Pre-investigation questions, questions designed for maximum group responses and interaction--What can we find out about that rotten log? What would be important to look at?

Evaluation: Will the pre-activity question create interest and motivation to the audience to gather data? Yes No
Are the questions varied? Yes No

Task Card

Directions for gathering data for the investigation:
(See sheet Data Collecting Guidelines for Environmental Problem Solving)

Data recording for the investigation (types of instruments, charts, graphs, tables, description, etc.):

Evaluation: Does the activity gather data that will help support the purpose? Yes No
Does the activity actually involve learner in collecting and recording data? Yes No
Does the activity include opportunities for learning to make his own interpretations? Yes No

20

Post Investigation Discussion

Open Question to bring out the "What's" (What did you notice?, What did you see?, etc.)

1.

Focusing Question on specific points to be compared, contrasted, or related to other points of specific data (How do you account for ...? Why are these things like that?)

1.

2

Interpretive Questions to elicit comparing, contrasting, and relating of points within the field of data--What differences did you notice between rotten logs of the two different trees?

1.

2.

3.

Capstone Question for summarizing generalizations--What can we say about..? How can we summarize what we've done and discussed about the rotten log study?

1.

Evaluation: Does the question sequence lead the people to make generalizations that coincide with the purpose?
Does each of the questions in the question sequence match up with the criteria below?

Open - allow everyone to participate. Get a lot of data.

Focus - focus attention on specific data as a central point for discussion.

Interpretive - seeks relationships. Compare, contrast, relate specific points in the data.

Capstone - calls for a statement which summarizes what has been discussed.

VI. MISCELLANEOUS

BEHAVIORAL OUTCOMES

Many instructional specialists contend that the single most important instructional advance of the past several decades is the current quest for clarity in the statement of educational outcomes. Today more than at any previous time in educational history, educators are being urged to clarify the descriptions of the outcomes they hope to achieve through their instructional efforts.

It is important that we be able to distinguish between instructional objectives which are well formed and those which are not. Well formed objectives possess a tremendous advantage over other objectives in that they reduce ambiguity. This ambiguity reduction leads to significant dividends in planning instruction and evaluation. The less ambiguity that surrounds a statement of an educational outcome, the more cues we have regarding what kind of instructional sequence will prove effective. The less ambiguity, the more readily we can devise precise measures to reflect that outcome. Well formed objectives thus constitute a useful mechanism for improving instruction and evaluation.

(From stating educational outcome S W Regional Laboratory for Education R & D)

SOME GUIDELINES FOR DEVELOPING OBJECTIVES OR PERFORMANCE TASKS

1. An objective describes an expected change in the learner's behavior.
2. When the learner has DEMONSTRATED this behavior the objectives have been achieved.
3. An objective is a group of words and symbols which communicate the expectation of the learner so exactly that the others can determine when the learner has achieved it.
4. A meaningful stated objective, then, is one that succeeds in communicating your expectation for the learner.
5. The best objective is the one that excludes the greatest number of possible alternatives to your goal. (No misinterpretation)

Cromwell Park School, Shoreline, Wash.

CRITERIA TO EVALUATE OBJECTIVES

1. Have you identified who the learner is?
2. Have you described the behavior the learner will demonstrate as evidence that he has achieved the performance task?
Is it measurable action or performance by the learner? (see list of Action Words)

3. Have you stated the conditions you will impose upon the learner when he is demonstrating his mastery of the performance task?

Examples:

- using the length of his own step he will demonstrate _____
- given a list of rocks he will distinguish _____
- given a set of tree samples he will construct a dichotomous key _____
- using a highway map of his state he will describe _____

ONE WAY TO SET UP YOUR OBJECTIVE

INSTRUCTIONAL OBJECTIVE: (put in phrases)

What will the learner by DOING?	Write:
What CONDITIONS will be imposed?	
How will success be RECOGNIZED?	

Now write the complete instructional objective below, evaluating it with the criteria above.

Select the statement in each number below that best describes what the learner will be DOING when demonstrating his achievement of the performance task.

1. Describe various things observed in nature.
2. Describe accurately a land area.
Construct a map of a predetermined land area by using compass bearings and distances.

3. Develop an appreciation of the aesthetics of our environment.
Identify one thing in your environment that makes it more beautiful to you.
4. Demonstrate needed operations to calculate height of tree.
Demonstrate how to measure the height of a tree using a stick longer than your arm.

ACTION WORDS

Here are nine action words from the American Association for the Advancement of Science that apply to curriculum related activities in the environment. These are not the only usable action words.

- Identify - The individual selects a named or described object by pointing to it, touching it, or picking it up.
- Name - The individual specifies what an object, event, or relationship is called.
- Order - The individual arranges three or more objects or events in a sequence based on a stated property.
- Describe - The individual states observable properties sufficient to identify an object, or relationship.
- Distinguish - The individual selects an object or event from two or more which might be confused.
- Construct - The individual makes a physical object, a drawing or a written or verbal statement (such as an inference, hypothesis, or a test of any of these).
- Demonstrate - The individual performs a sequence of operations necessary to carry out a procedure.
- State a Rule - The individual communicates, verbally or in writing, a relationship or principle that could be used to solve a problem or performs a task.
- Apply a Rule - The individual derives an answer to a problem by using a stated relationship or principle.

BEHAVIORAL TERMS

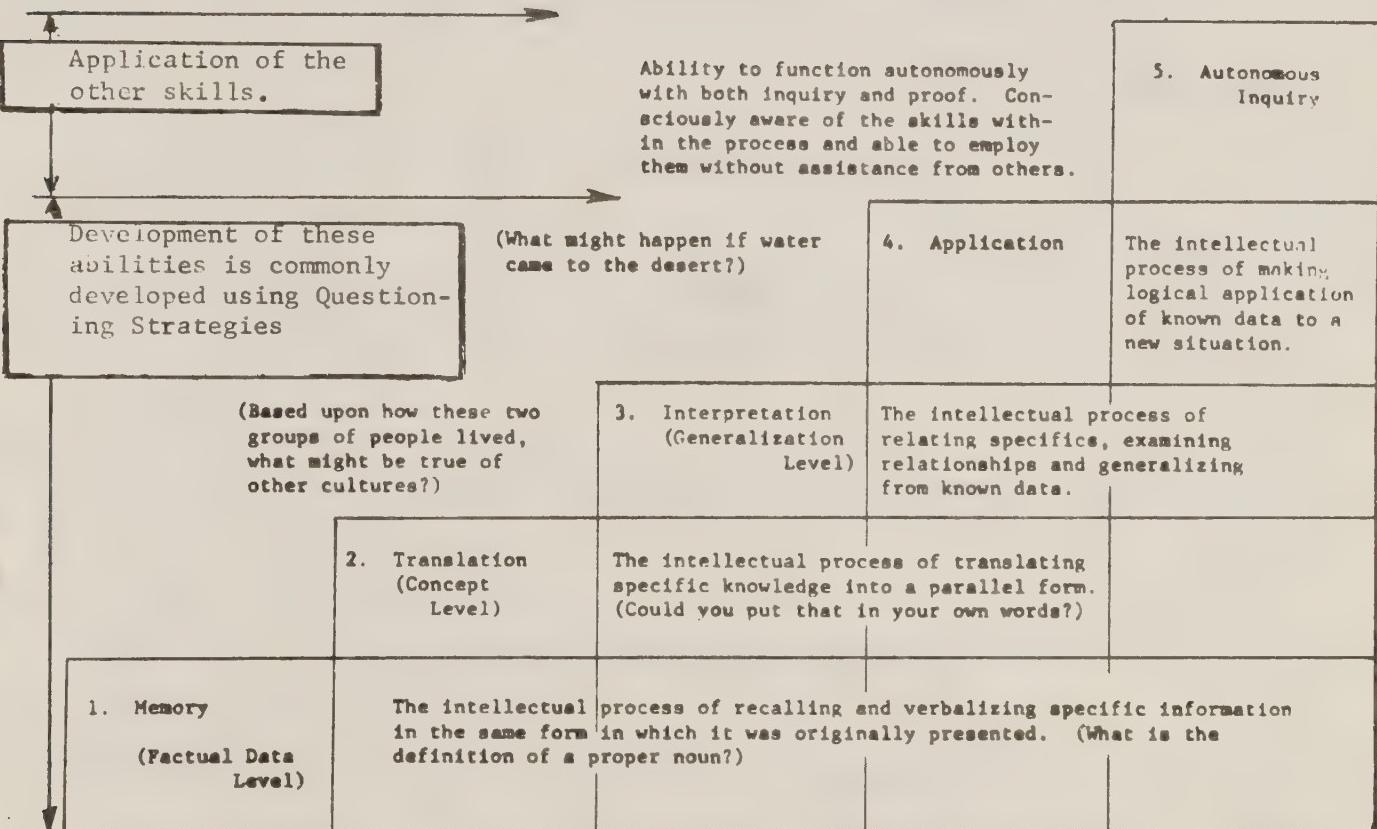
The majority of our educational objectives can and should be stated in behavioral terms. It is recognized that there are some meta-objectives which must be more subjectively stated and performance subjectively measured. The terms listed below represent an effort to formulate a list of the most common and applicable terms which have meaning for the teacher developing objectives related to the areas of knowledge, skills and habits, understanding and concepts.

- | | | |
|----------------|----------------|-------------------|
| 1. Describe | 14. Locate | 27. Present |
| 2. Interpret | 15. Express | 28. Discover |
| 3. Observe | 16. Analyze | 29. Support |
| 4. Demonstrate | 17. Apply | 30. Question |
| 5. Sketch | 18. Operate | 31. Create |
| 6. Identify | 19. Illustrate | 32. Calculate |
| 7. Compare | 20. Diagram | 33. Organize |
| 8. Translate | 21. Perform | 34. Develop |
| 9. Contrast | 22. Listen | 35. Recite |
| 10. Relate | 23. Write | 36. Differentiate |
| 11. Generalize | 24. Read | 37. Construct |
| 12. Formulate | 25. Review | 38. Solve |
| 13. Define | 26. Use | 39. List |

TERMS TO AVOID IN STATING BEHAVIORAL OBJECTIVES

- | | | |
|---------------|---------------|----------|
| 1. Enjoy | 4. Understand | 6. Know |
| 2. Appreciate | 5. Like | 7. Grasp |
| 3. Faith | | |

The development of thinking ability may be considered in relation to the following hierarchy of process:



*The above hierarchy of thought process has been taken principally from two sources:

1. Bloom, Benjamin S., Taxonomy of Educational Objectives, Handbook I, Cognitive Domain, David McKay Co., New York, 1956.
2. Sanders, Norris M., Classroom Questions, What Kinds? Harper and Row, New York, 1966.

(Those who are familiar with these sources will recognize that synthesis or creative thought processes, and evaluative thought processes have not been included. While these two additional processes are considered extremely important, the following materials deal exclusively with the first four levels of the hierarchy.)

The sequence of activities in constructing Environmental Investigations has been developed over several years of workshops and training sessions. It is a collection of a few items that can be useful in developing your own investigations with groups and classes. Many people have contributed to this lesson with special thanks to Mr. Dick Phillips, Milwaukee School District, Oregon.

This lesson plan was revised in February 1973. It is suggested that continuous revision take place by the people who use the ideas.



LESSON PLAN FOR IDENTIFYING SOME TECHNIQUES OF GROUP INVOLVEMENT

The activities in this Lesson Plan have been developed and used over the past several years to provide leaders with some tools to help groups work together while investigating environmental concerns. Many people have contributed to this lesson. Special thanks, appreciation and recognition is given to Dr. Mike Giannatto, who exposed many of the authors to these techniques and has given permission to reprint selected activities here. This Lesson Plan was developed in February 1973. It is suggested that continuous revision take place by the people who use the ideas.

		<u>Group Size</u>
I.	(Task A - Concern Cards) Identifying Factors that Affect Learning and Communication (45 minutes)	1
	A. Curriculum Ball and Colored Glass	Total
	B. Tempo (Task B)	Total
	C. Factors that Affect Learning Chart (Task C)	3
II.	Identifying Roles Played in Groups (45 minutes)	Page <u>7</u>
	A. Role Playing Activity (Task D)	4
	B. Productive Roles 1-2	
	C. Non-Productive Roles (Task E)	
III.	Communicating in Different Ways (60 minutes)	Page <u>9</u>
	A. Non-Verbal (Task F)	5
	B. Active Listening (Task G)	2
	C. Asking - Responding (Task H)	2-3
IV.	Planning Group Arrangements (Task I) (30 minutes)	Page <u>25</u>
	A. Some Ideas for Promoting Interaction in Groups (Task J)	1
	B. Stages of Group Growth (Task K)	2
		3
V.	Identifying the Role of the Facilitator (Task L) (30 minutes)	Page <u>30</u>
	A. Facilitator Role	
	B. Recorder Role	
	C. Some Concepts of Leadership	
	D. Shared Leadership	
	E. Some Ideas in Dealing with Group Conflict	
VI.	Identifying Discussion Skills (30 minutes)	Page <u>39</u>
	A. Those That Affect Group Participation	1-Total
	B. Those That Affect the Content and Discussion	



Group Size

VII.	Identifying Different Grouping Activities (30 minutes)	Total
		Page <u>53</u>
A.	Concern Cards	1
B.	Miri-Market	Total
C.	ABC Exercise	3
D.	Issue Analysis	
E.	Charges - Facts - Denials	

VIII.	Developing a Plan of Action for Conducting a Meeting to Insure a Maximum of Group Participation (30 minutes)	3
		Page <u>57</u>

Miscellaneous

- 5 Square Problem Sheets
- Role Playing Lab Sheet

Lesson Plan for Identifying Some Techniques of Group Involvement

In the next four hours we will become involved in a variety of activities that will illustrate methods of obtaining a high quality of group participation at meetings; identify some steps necessary to plan for group participation and then develop a plan of action necessary to conduct such a meeting.

Questions and Discussion:

1. List on a 3x5 card two concerns or questions you have about providing for group involvement. Turn your cards in. (Task A)
2. One technique to insure group participation is to break into smaller groups of people. What are some reasons to divide into smaller groups? (Discuss-- eg., to hash over points already discussed; when you want work done, make recommendations on a group consensus or something).
3. How many ways can you divide people into small groups? Discuss.

Examples:

- a. Pairs - limit use. When you want them to discuss something quickly, without distraction, for a brief period of time.
- b. 4-5 people - best for good sharing of ideas, getting consensus, developing recommendations, etc.
- c. 6 or 9 - gets too bulky for good discussion. If the length of time is short, the numbers of people will limit the participation.

I. IDENTIFYING FACTORS THAT AFFECT LEARNING AND COMMUNICATION

A. Curriculum Ball and Colored Glasses Activity (Trip Glasses and Colored Rubber Ball)

- (Ask someone to come up front.)
- Say, "See this red ball, do you think you can catch it?"
- OK. (Toss it to person so he can catch it.)
- "Good - throw it back."
- "Here catch it again, fine, throw it back."
- "Now put on these glasses." (Turn to show audience.)
- "What do you see?"
- "Now I want you to catch this red ball again - do you think you can?"
- "Here it comes nice and easy, just as before."
- "Oops you missed. What's the matter? It's the same red ball."
- "OK - thank you - you can take off the glasses now."
- (Turn to audience) What happened? Why didn't he catch the ball with the glasses on? (Wait for responses from group.)

From: Dr. Mike Giamatteo

- As long as we came from the same background, with similar set of experiences, I was able to send him the curriculum ball, or the environmental message and he was able to receive or catch it.
- But as soon as we changed his set of experiences or how he saw things (the glasses distorted his sight vision - it slowed down his tempo or ability to react fast enough to understand the sender.)
eg., - same way - common set of experience difference - couldn't catch ball.
- important to have common experience and to build an understanding together in order to communicate.
- Glasses can represent many things:
 - glasses are symbolic. Child looks at world differently than the world looks at it.
 - different set of experiences.
 - distortion is greater if person comes from different social, racial, or economic background.

B. Tempo Activity

From: Dr. Mike Giamatteo

(Ask person in back of room) - How many seconds will it take for you to get here?) 4 seconds. OK try it. (Count 1, 2, 3, 4, etc., until person gets to you.)

(Ask another person the same question, and have him come up.)

(Put glasses on person #1, and ask #2) - "How long will it take you to take person #1 back to his (her) seat?" (Ask #1 to remove glasses. How did you feel going back to your seat?) (Discuss how person #1 felt.)

eg., Safe because of touch of other person.

Safe because of his talking in soft tones.

Scared because person #2 walked too fast.

Scared because person #1 hit a chair, etc.

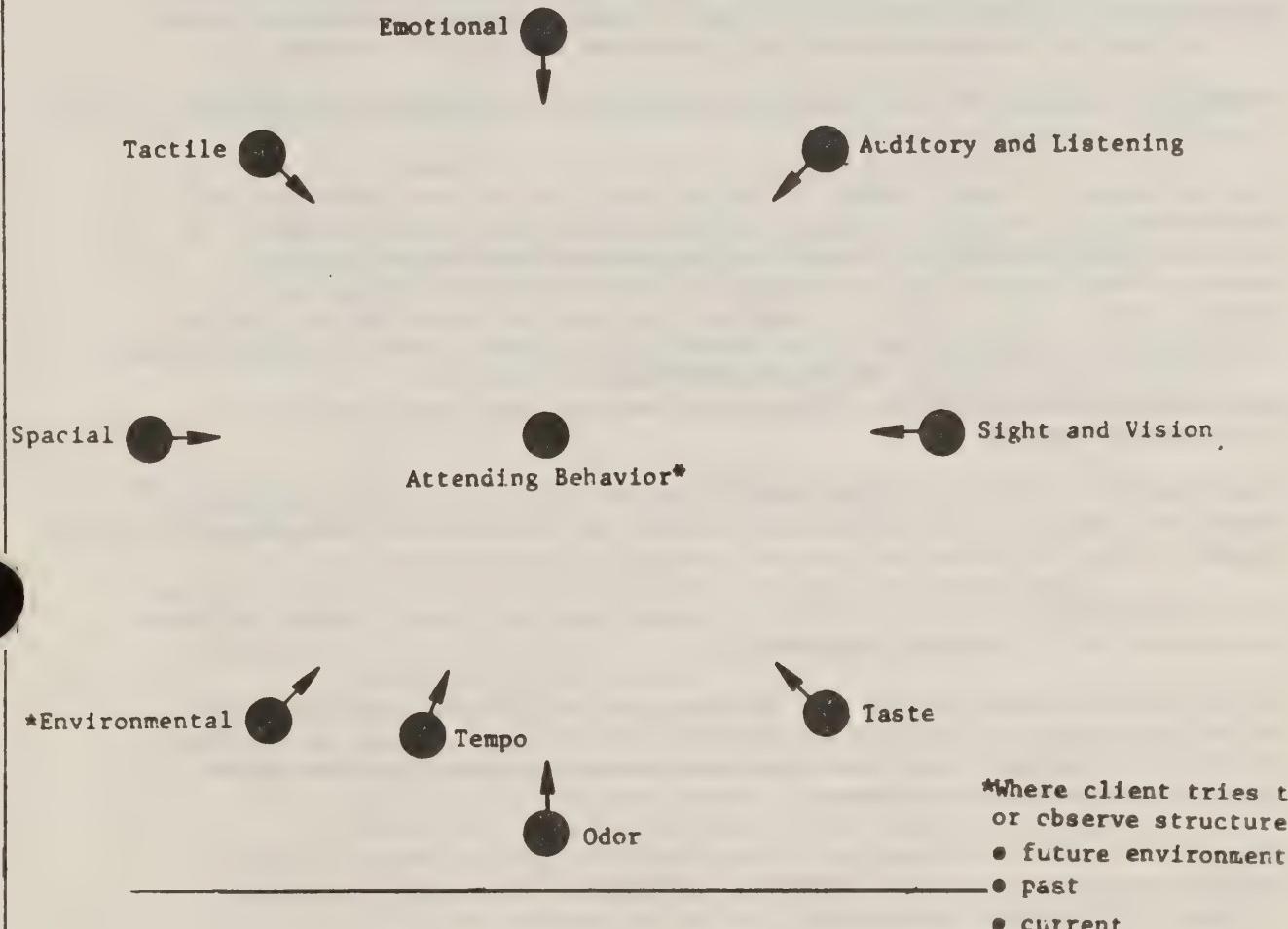
Task B

Working in pairs - discuss and write some examples where you miscommunicated with someone because your tempo or background was different than theirs.

C. Factors that Affect Learning Chart

If we are going to more effectively communicate, we may have to consider many of the factors of learning in this diagram.

- a. How many factors on this chart have we been involved in so far? (Group responses.)
- b. If one of the learning factors is distorted, we may have to emphasize one or more of the other factors on this chart in order to provide an effective learning experience for the participant. (Example: When tempo and vision were distorted by the glasses, we relied on touch to get the person safely to his chair.)
- c. All the forces on this chart must be considered in how a learner receives the experiences and how he uses it.

Task CFACTORS THAT AFFECT LEARNING

*Where client tries to create or observe structure from

- future environment
- past
- current

Working in pairs:

1. Circle the factors on this chart that we have been working on so far.
2. Write down some ideas on:
 - a. What this chart tells us about learning experiences.
 - b. What implications this chart has for group involvement.

STATEMENTS FROM TEACHERS AT CAMP MURRAY 1972 ABOUT WHAT THE CHART,
"FACTORS THAT AFFECT LEARNING," TELL US

Learning has to do with and is dependent upon the learners' previous learning experiences, attitude and recentiveness to the present situation, including the surroundings, the working of all senses and the people involved.

Learning is complex in that there are many factors, internal and external, depending upon personal position.

Told a student to make a black and white print for the newspaper and gave the student the negative. When he delivered the print to me it was dried matt and I had assumed that she knew newspaper prints should be dried glossy. Make sure you do not expect the student to know things that he doesn't know. Do not assume. Make sure you are not expecting too much of the student. All the items on the chart could directly affect the performance of the person you are attempting to communicate with.

All learning experiences are different. Many factors contribute to a learning experience.

Many factors contribute to the learning experience. A successful learning experience depends on an integration of all factors involved. We often assume others are operating from the same set of reference as we.

A learning experience is effected by several factors. People bring different backgrounds to a learning experience.

If the persons communicating are not "in tune" on the various things that affect learning, the learning process will be hindered. A person is often so involved in "self" that they fail to observe or investigate the other person's feelings and attitudes.

Behavior is center of learning. Background experiences affect learning and/or inability to learn. Immediate environment can relieve learning problems or increase capability.

We must understand what is blocking ones' learning so that it may be overcome. Outward stimuli and experience affects the learning process. As one becomes more inquisitive, more learning can take place.

The chart indicates that the total person is involved in a learning experience. If one of these areas is lacking, the other areas would have to be depended upon more in order to communicate effectively.

Learning experiences are hampered when various factors are missing such as auditory or vision. If a missing factor is present, other factors may be stressed more to make that learning experience complete. We must be aware of this to correct it.

For most effective learning to take place, you must be tuned in at the same level and proceeding at the same tempo in a compatible environment.

II. IDENTIFYING ROLES PLAYED IN GROUPS

From: Dr. Mike Giammattie

A. Role Playing Activity:

Roles played by people in the group affect learning too. In order to more effectively work with groups it is important to recognize some of the roles people assume in groups. Some are productive and some are non-productive. Many times people are not aware that they play certain roles.

Task D: 5 minutes (See page 63, for role playing slips.)

1. Get into groups of four. (When in groups of four, do Step 2.)
 2. Each of you is being given a slip of paper with the role you are to assume--play it as convincingly as you can. (Cut up copies of the sheet with the roles on it.)
 3. The problem -
It is 90° outside--your group wants to go on a picnic--it is 2:30 P.M. One person in your group is to start the plans for the picnic.

Questions and Discussion:

There are many roles, let's look at the four that you just played.

Placator--always soothes over the discussion.
"Everything in due time"
"The sun will shine tomorrow"

Attacker--always attacks ideas presented or will be negative.
"You know the administration will never go along with that"
"People don't care, our group would never do that without pay"

Irrelevant--ideas given that do not relate to the topic (evader).
"Did you see the movie last night?"
"Who's bringing the coffee for the next meeting?"

Sensible--always tries to be as sensible as possible.
"Let's review where we are"
"Why don't we get back to the purpose of the meeting"

3. Turn to sheet "Other Roles Played in Groups" and discuss the categories and roles quickly.
4. Take five minutes in each group and discuss and list some ways to deal with the non-productive behaviors just mentioned. (Task E)

B. Other Roles Played in Groups:

Productive Roles--which people assume to share in solving a problem or making a decision.

1. Initiator--suggests an idea, proposes a solution, says "let's do this."
2. Energizer--prods the group to decision and/or action, stimulates the group, reminds them of the purpose of the group or meeting.
3. Information Seeker--asks for facts, for background information, for clarification, helps group see need for sufficient information for decision making.
4. Orienter--helps group define its position in relation to its goals (Where are we now?), points to departures from goals or objectives, raises questions about the direction the group is moving (Where are we going?).
5. Summarizer--pulls together ideas, suggestions, comments or relevant information to help group understand where it is in its thinking or action process. (Gets us back on the right track.)
6. Encourager--accepts and praises contributions of others, sets atmosphere of friendly acceptance, tries to arrange for everyone to contribute, gently urges group forward. "Let's work together." Aids approval of idea.
7. Harmonizer--points out similarities instead of differences, helps keep group on problems and away from personalities, works toward consensus. "It seems both your ideas are about the same." "That's a good idea but don't you think we ought to consider what Mary just added?"
8. Follower--goes along with the group, passively accepts ideas of others, provides an audience for active members, supports through his presence. "I'll go along with that."

C. Non-Productive Roles--which people assume to stop action. Roles that attempt to satisfy individual needs first.

9. Dominator--tries to get his own way without regard for others; uses flattery, authoritative behavior, sarcasm, etc. Downgrades others' contributions.

- D. Non-Productive Roles--which people assume to stop action. Roles that attempt to satisfy individual needs first.
10. Blocker--tries to prevent something from happening, argues, openly rejects ideas, delays in personalities. Interferes with progress by going on tangents, personal experiences on unrelated things, argues unnecessarily on a point, rejects ideas without all facts, may weaken an issue.
 11. Special Interest Pleader--tries to gain decision or action favorable to a special group or project regardless of group wishes, uses stereotyped phrases or cliches', appeals to emotion, cites precedents, usually refuses to compromise, etc. States own biases, a special program for his personal gain.
 12. Playboy--makes a display of his lack of involvement in the group's efforts and activities, indulges in horseplay, unrelated jokes or comments, "penlicking" or "rubber-band snapping," or other attention-getting behaviors. "Anyone want some gum?" "Have you seen the new TV show?"

Task E

Each group take five minutes and discuss and list some ways to deal with the non-productive roles above.

- a.
- b.
- c.
- d.
- e.

III. COMMUNICATING IN DIFFERENT WAYS

A. Non-Verbal Cooperation Game

Have audience get into groups of five.

Each person should have an envelope containing pieces for forming squares and these instructions.

Start when the stopwatch is started.

When you begin, the task of the group is to form five (5) squares of equal size. The task is not completed until everyone has before him a perfect square and ALL THE SQUARES ARE OF THE SAME SIZE.

NO MEMBER OF THE TEAM MAY SPEAK.

NO MEMBER MAY ASK FOR A CARD OR IN ANY WAY SIGNAL THAT HE WANTS ONE. MEMBERS MAY GIVE CARDS TO ONE ANOTHER.

As soon as you finish, record how much time it took you and replace the cards in the envelope with the same letter as that on the card.

Task F (15 Minutes) (Working in groups of five)

Solve the Broken Squares problem; see pages 58 to 62 for problem squares.

Questions and Discussion:

1. What happened in your group?
2. What kept you from solving the problem?
3. What helped you solve the problem?
4. Take five minutes and discuss with your group some behaviors observed that affected the groups problem solving.

B. Active Listening

Most messages have two parts, one part is the content and the other part is the feeling. It is easy to spot the content but more difficult to identify the feeling. We are going to do an activity to help zero in on these active listening skills.

Task G - Active Listening

Get into groups of two and do the exercise on pages 11-15. Read instructions to whole group.

EXERCISE IN LISTENING

From: Dr. Mike Giannmatteo

Instructions:

Divide into pairs. Person A should read statements 1-12 with the intent of expressing the feelings specified in the right-hand column. Person B should listen for the feeling being expressed and write (on the sheet provided) the word or phrase that describes that feeling. The feeling, rather than content should be described. Some of the statements may contain more than one feeling. Each feeling should be noted.

Person B will then read statements 13-24, while Person A listens and writes.

After both A and B have had a chance to listen for feeling they can check on their answers.

Examples:

What the Person Says	What the Person is Feeling
a. I don't know. Nothing seems to go right for me.	a. Discouraged, bothered.
b. I wish I could find someone to talk to about my problem. I just can't figure out what I should do. Oh, darn!	b. Worried, concerned, anxious.
c. Wow, I just won a scholarship to college! Isn't that really great!	c. Elated, excited.

<u>What the Person Says</u>	<u>What the Person is Feeling</u>
1. What! You did all that today?	1. Can't believe it, amazed, unbelieving.
2. Things will work out OK. In fact, I want to get started right away.	2. Still a chance, hopeful, bitter, resentful.
3. I've been married 15 years. I've given him all I've got. I've never shirked my duty, never complained. Now he tells me I haven't grown with him. How unfair can you get!	3. Mad, hateful, bitter, resentful.
4. You know what? My endurance increased every month now since I started those exercises. I'm glad you had that talk with me. Thanks for the help.	4. Thankful, pleased, proud, happy, appreciative, grateful.
5. No question about it. I've heard that sort of thing before. I know I'm right. Those other guys are all wet. We just need a new boss. It's just that simple, no matter what they hand you.	5. Confident, certain, positive.
6. I feel like leaving this place everyday. Why wait around until they fire you on a whim. It's getting so bad you can't even look cross at anyone.	6. Bothered; not wanted, insecure, precarious, tentative.
7. Well, don't you think you would like the same thing done if you were in my shoes? Does n't everyone feel this way?	7. What would you do, I'm justified, after all I should feel this way, I'm not out-of-line.
8. This place is a second home to me. I feel it fits me like an old shoe.	8. Pleased, comfortable, contented, satisfied.
9. Looking back on what I did, I can't believe it was me.. I shouldn't have treated her that way.	9. Sorry, wanting forgiveness, guilty, ashamed.
10. Man, I wouldn't treat an animal the way he treated me. Who does he think he is anyway. I should have hit him right in front of that crowd.	10. Distressed, disturbed, mistreated, offended.
11. I don't care what happens to me anymore, I've really had it. Why go on? It's not worth it.	11. Why fight it, depressed, feel like giving up, discouraged.
12. O.K. I said I was sorry, didn't I? What more do you want me to do? I know I was wrong. You want me to beg?	12. Back away, lay off, I've got the picture.

<u>What the Person Says</u>	<u>What the Person is Feeling</u>
13. Do you mean that? You think I should go back and just tell him to his face? Won't that make him mad at me?	13. Afraid of consequences, hesitant, not sure.
14. I came up the hard way--none of that education stuff. These young punks have it made. Wish I'd had the money to get me a degree. I'd have it made.	14. Fantasy dreams, resentful, envious, feeling of unfairness.
15. I'd like to check with you again on this job you gave me. I've got an answer to it but I don't know. Maybe it's kind of nutty. You know more than I ever will on this kind of thing.	15. Unsure, inadequate, can't trust myself
16. You know, I've been feeling this way for a couple of weeks? It should have gone away by now. What causes this sort of tiredness?	16. Bothered, concerned, worried.
17. I wish he would let me know how I'm doing. He never gives me credit for anything anymore.	17. Uncertainty, feeling of lack of appreciation, need reassurance.
18. I've known of others that tried this and didn't do much good. Look at the Nelsons. They've gone broke. It sounds good, but I don't think it will work that way.	18. Doubtful, not sure, suspicious.
19. Now that he did it for me, I have to do it for him. But I sure don't feel up to it.	19. In a bind, obligated, in debt.
20. My boy won a football award at school. Neat? Yeh, he's a real boy. Tell me, how do you make your boy study? Maybe we've let our boy get off too easy.	20. Pleased, but concerned; concerned about my son.
21. Tell me something, will you? How much do you think the average man my age makes per month? Of course, my Dad died when I was 18 and that held me back, you know.	21. How do I stack up kind of concerns, Am I on target, worried about my role for my age.
22. Do you definitely need the reports by Monday? I also have that other job as well as the things at home. When is this rush going to let up?	22. Overloaded, under pressure, not enough time.
23. Can't we go on to another idea? Why do we have to beat this dead horse another hour?	23. Fed up, sick of the discussion.
24. It's ten o'clock. The meeting was called for 9:30 a.m. I hate to just come in and sit every week waiting for them to show up.	24. Irritated, anxious to begin, resentful.

RESPONSE SHEET I

The other person in your group will read several statements. Write down the feelings expressed in each statement.

	<u>Score</u>
1.	_____
2.	_____
3.	_____
4.	_____
5.	_____
6.	_____
7.	_____
8.	_____
9.	_____
10.	_____
11.	_____
12.	_____

Scoring Key

Mark a score of 4 if the answer is matched closely to the one listed. If the answer is similar or partially correct, make a score of 2 beside the item. If you missed completely the feeling, mark in a zero (0) beside the item. A total score between 40 and 48 implies active listening; a score between 28 and 36 implies acceptable listening; scores below would suggest additional practice is needed. In all instances we must continue to maintain or improve our active listening.

RESPONSE SHEET II

The other person in your group will read several statements. Write down the feelings expressed in each statement.

	Score
13.	<hr/>
14.	<hr/>
15.	<hr/>
16.	<hr/>
17.	<hr/>
18.	<hr/>
19.	<hr/>
20.	<hr/>
21.	<hr/>
22.	<hr/>
23.	<hr/>
24.	<hr/>

Scoring Key

Mark a score of 4 if the answer is matched closely to the one listed. If the answer is similar or partially correct, mark a score of 2 beside the item. If you missed completely the feeling, mark in a zero (0) beside the item. A total score between 40 and 48 implies active listening; a score between 28 and 36 implies acceptable listening; scores below would suggest additional practice is needed. In all instances we must continue to maintain or improve our active listening.

C. Asking - Responding

From: Dr. Mike Giannattasio

The way in which we ask or respond to a question makes a difference in how well we are able to communicate. Certain methods of questioning will bring about communication, others will prevent it.

Task H - Asking-Responding

Do the asking and responding exercise on pages 16 to 24.

Read the instructions.

Point out that there are activities for 1 - 2&3 people.

Asking and Responding Exercises:

The way in which we ask or respond to a question makes a difference in how well we are able to communicate. Certain methods of questioning will bring about communication; others will tend to prevent it.

Asking and responding exercises are designed to teach people new ways of asking and responding to questions. By understanding these alternative ways of questioning, one will be able to choose that method which will bring about real communication.

The following exercises are included in this lesson:

- o judgmental responses
- o non-judgmental responses
- o leading questions
- o loaded questions
- o open-ended questions
- o closed questions

Exercise One - Judgmental Responses

Definition: A judgmental response reflects a person's personal opinions and values. When one responds judgmentally, he may--

- (1) Show approval of another person's ideas or actions (A)

Example: "That was a great plan. You've got what it takes."

- (2) Show disapproval of another person's ideas or actions (D)

Example: "That wasn't very smart of you! Now look at the mess we're in."

(3) Persuade another person to act or think as we wish him to (P)

Example: "How about checking your ideas with me from now on?"

Task 1 - Individual Task

- o Write three examples of A (approval), D (disapproval), P (persuasive) types of judgmental responses to the following statement--

"I've decided to move from my apartment."

A _____

A _____

A _____

D _____

D _____

D _____

P _____

P _____

P _____

Task 2 - Work in Groups of Three

- o Write three examples of A (approval), D (disapproval), and P (persuasive) types of judgmental responses to the following statement--

"I've changed the date that assignment is due."

A _____

A _____

A _____

D _____

D _____

D _____

P _____

P _____

P _____

Task 3 - Individual Task

- o Label responses to the following statements--

1. "I can't cut this job; can I move to another one?"

 "Come on--try it a couple more days."

 "Be glad you have a job and don't complain so much."

 "Your work is just fine. No need to worry."

2. "Don't you like the way I handle this car?"

 "Slow down! I want to live."

 "Sure do. Can you go any faster?"

 "You really ought to watch those speed signs more carefully."

Task 4 - Individual Task

- o How would you respond to the following statement? Include A, D, and P responses.

"This assignment is going to be tough to do."

A _____

D _____

P _____

Exercise Two: Non-Judgmental Responses

Definition: A non-judgmental response does not reflect a person's opinions and personal values. When one responds non-judgmentally, he may--

- (1) Seek more information (SMI)

Example: "When was the last time he disrupted the class?"

- (2) Check his understanding of the person's attitude or emotions by reflecting that person's feelings (RF)

Example: "His behavior is upsetting you?"

- (3) Check his understanding of the person's information or ideas by paraphrasing the content (PC)

Example: "In other words, you don't think we ought to do that until we check with your father."

Task 1 - Do in Trios

- o Write two examples of SMI (seeking more information), RF (reflection of feeling), and PC (paraphrasing content) in response to the two following questions.

Practice Sample:

"He is always picking on me!"

SMI: "Can you tell me other instances where this happened?"

RF: "You're feeling unhappy about this?"

PC: "You mean he gives you a bad time?"

1. "You're not going to let her do that, are you?"

SMI _____

SMI _____

RF _____

RF _____

PC _____

PC _____

2. "Isn't that guy impossible to work with?"

SMI _____

SMI _____

RF _____

RF _____

PC _____

PC _____

Task 2 - Individual Task

- o Label responses to the following statements as SMI, RF, PC--

1. "This is a tough bunch of kids I have to work with."
____ "They get pretty rowdy at times, huh?"
____ "How long have you been working with them?"
____ "You're worried you won't be able to handle them?"
2. "I get nervous each time he comes in here."
____ "You're concerned that you aren't doing the task right?"
____ "He makes you jittery?"
____ "How often does he barge in like that?"
3. "I feel silly coming to you with this problem."
____ "What is the problem?"
____ "It embarrasses you to talk about that?"
____ "You want to talk to me about your problem?"

Task 3

- o How would you respond to the following statement? Write SMI, RF, or PC responses.

"I get so tired at times."

SMI _____

RF _____

PC _____

Definition of a leading question (L): When a person asks a leading question, he suggests how he wants the other person to answer. In this sense, leading questions are judgmental because the asker reveals his own feelings. At the same time, the respondee's answer may not reflect how he really feels. The asker cannot trust the information obtained for he has already suggested what would be acceptable answers.

Examples of leading questions:

- "It would be a good idea to keep our instruments in order, wouldn't it?"

This question suggests the following answer: "Yes, it would be a good idea." Maybe the person would rather say: "No, I think it is a terrible idea."

Other examples--

- "You agree with Dr. Smith who has ten years' experience in this field, don't you?"
- "Of course, the wise thing to do is talk to her, isn't it?"

Definition of a loaded question (LO): A loaded question traps a person. Because of the construction of the question, the respondee is caught no matter how he answers.

Examples of loaded questions:

"Have you stopped getting your instruments mixed-up?"

"Yes, I have (stopped getting my instruments mixed-up)"

"No, I haven't (stopped getting my instruments mixed-up)"

Whether or not the respondee has stopped getting his instruments mixed-up, he must admit that, at some time, his instruments were mixed-up.

And--

"When are you going to stop being so stubborn?"

No matter how the person answers, he is admitting that he is stubborn.

Leading and loaded questions can be used in a positive as well as in a negative manner. They can be used in situations where a person wants to place restrictions on the other person's verbal or behavioral response.

An example of a positive use of a leading question would be a mother wishing to elicit from her child the response that will keep the child safe.

Mother: "The pot on the stove is hot and will burn your hand if you touch it. So you wouldn't touch it, will you?"

An example of a positive use of a loaded question would be in using it for confrontation purposes such as a doctor speaking to his patient.

Doctor: "When are you going to stop smoking?"

Task 1 - Triad Task

- o List three examples of both leading and loaded questions which you should avoid in your work situation:

L _____

L _____

L _____

LO _____

LO _____

LO _____

Task 2 - Group Task

- o Give examples of situations where you might use the following questions to avoid leading and loaded questions:

"Are you glad you act that way?"
 "Should everyone believe that?"
 "Why do you think so?"
 "Is this what you really think?"
 "What is the source of your idea?"
 "In what ways is that a good idea?"
 "Have you thought of alternatives?"

Task 3 - Individual Task

Label responses to the following questions as L(Leading) or LO (Loaded):

1. "Have you stopped getting your assignments mixed-up?"
2. "What's wrong now?"
3. "You see what I mean, don't you?"
4. "How about returning that book you borrowed last year?"
5. "He sure was mad, wasn't he?"
6. "When are you going to clean that messy room?"

Task 4 - Individual Task

Write two examples of leading and loaded questions:

L _____

LO _____

LO _____

Exercise Four: Open-ended and Closed Questions/Statements

Definition: Questions which restrict the number of possible answers are closed questions. The more a question allows the other person to decide what is important or relevant to him, the more open the question. An open-ended question allows a person a choice in how he wishes to answer; a closed question limits those choices.

1. Example: "I hate to see all of you suffer because just one person messed up."

Who goofed up? (C)
What happened? (O)

2. Example: Two children are fighting and the mother interrupts:

"Scotty, why are you always hitting your sister?" (C)
"What's the problem, kids?" (O)

3. Example: Father and son talking about the future:

"You are going to be a doctor just like daddy, aren't you?" (C)
"Have you thought about what you might like to be when you grow up?" (O)

Task 1 - Individual Task

o Label responses to the following questions with a C if it is a closed response and with an O if it is open.

1. "What would you like to do this evening?"

"How about going to that new restaurant tonight?"

2. "Are you coming home before 10:00?"

"When are you coming home?"

3. "Will you have the work done by four o'clock?"

"When can you finish that report?"

4. "How would you do it?"

"I think we ought to do it this way, huh?"

Task 2 - Triad Task

- o Write examples of closed and open questions in response to the following:

1. "She doesn't think I ought to dress this way."

(O) _____

(C) _____

2. "They close the place too early."

(O) _____

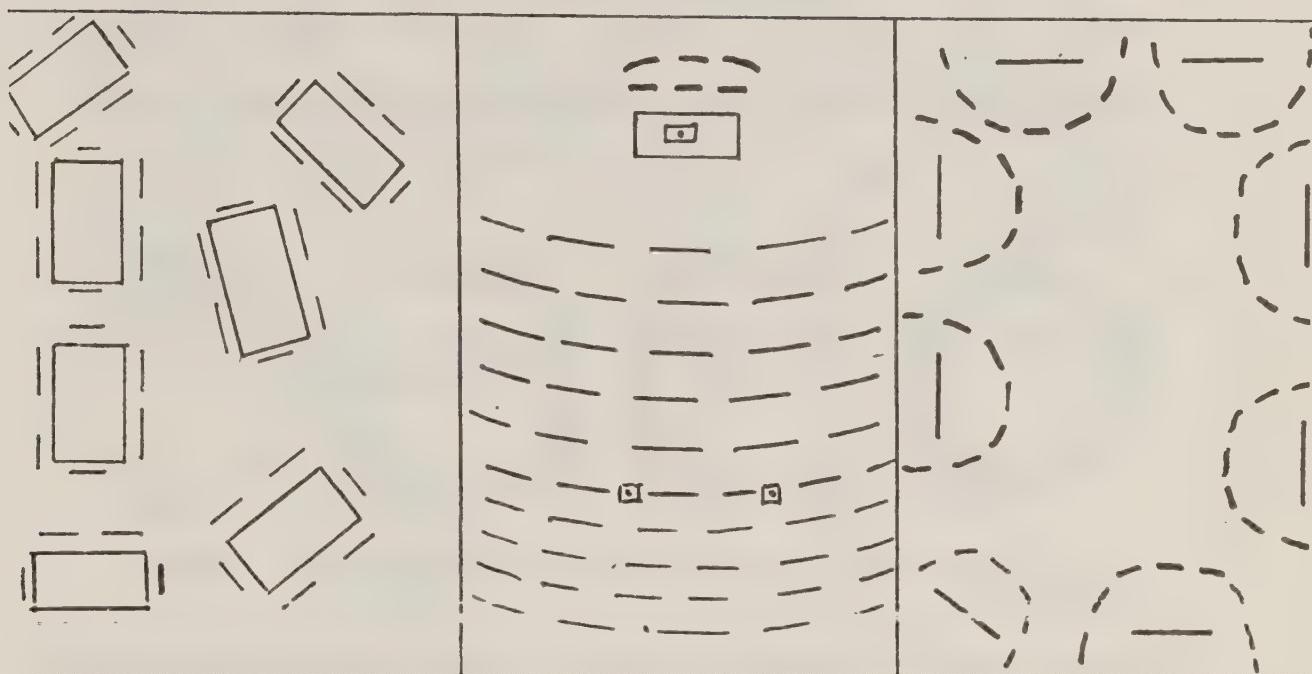
(C) _____

Summary: Whether or not a group is able to achieve its goals depends to a great extent on whether or not its members are able to communicate well with each other. At the same time, however, the group must be able to communicate its goals to members outside the group.

No one type of the six questioning strategies discussed above is appropriate in all cases. The appropriateness, of course, depends upon the situation. But if our goal is a greater exchange of information, we can best achieve it by using neutral, non-judgmental methods for discussion. These neutral methods will bring about open and effective communication.

IV. PLANNING FOR GROUP ARRANGEMENTS

Task 1 - Answer the questions below:



Which room arrangement:

suggests 'we talk, you listen' or 'you talk, we listen'

suggests limited 2-way communication (audience responses directed at one person)

will allow for maximum participation by the most number of people for the most time (where people talk to each other)

will allow a maximum quantity of information to be presented in a fairly short time

will allow an 'axe-grinder' the largest audience

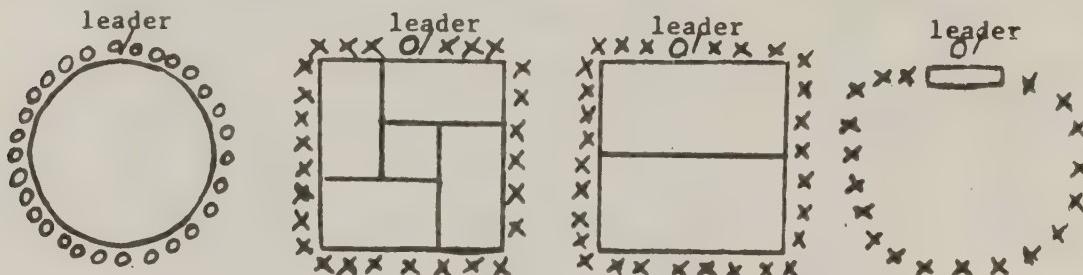
will allow input from all participants on an equal level

What does this tell us about meeting room arrangements?

SOME IDEAS FOR PROMOTING INTERACTION IN GROUPS

FROM: Dr. Mike Giannatto

1. Arrange group in circle, so each person can see every other person.
2. Provide table space, if convenient, for leader and entire group, as follows:

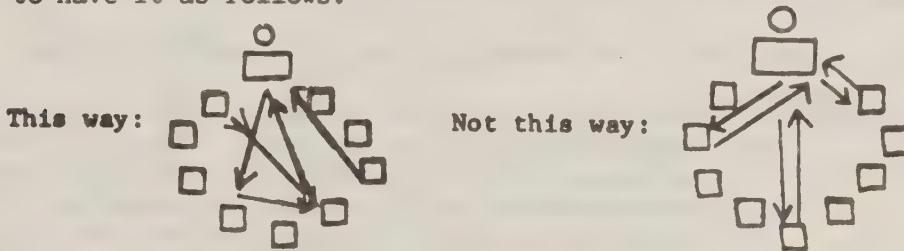


3. Let all stay seated during discussion, including leader. Keep it informal.
4. Start by making everybody comfortable. Check ventilation and lighting.
5. See that everybody knows everybody else. At first gathering go around the circle, each introducing himself. As a newcomer joins the group later, introduce yourself to him and him to the group.
6. Learn names of all as soon as you can.
7. Have blackboard, chalk and eraser ready for use in case of need. Appoint a "blackboard secretary" if the subject matter and occasion make it desirable.
8. Start on time, and close at prearranged time.
9. In opening, emphasize: Everyone is to take part. If one single member's view fails to get out in the open, insofar the discussion falls short.
10. Toward this, emphasize: No speeches by leader or group member. No monopoly. After this opening statement, limit individual contributions to a minute or so.

Carrying on

1. Make your own preparation for the discussion. Think the question through in advance. Aim to establish connections between ideas of background materials, and experience of ideas of group members.
2. Aim at outset to get a sharply defined question before the group. Have three or four alternates put on board if you think this will help, "Which do you want to start with?" "Is this question clear?"

3. In general, don't put questions to particular group members, unless you see that an idea is trying to find words there anyway: "Mrs. Brown, you were about to say something." Otherwise, "Let's have some discussion of this question. . . ." "What do some of the rest of you think about this?" "We've been hearing from the men. Now how do you women feel about this?" "What's been the experience of you folks up in the northern part of the State in this connection?" Etc.
4. Interrupt the "speechmaker" as tactfully as possible. "While we're on this point, let's hear from some of the others. Can we save your other point until later?"
5. Keep discussion on the track, keep it always directed, but let the group lay its own track to a large extent. Don't groove it narrowly yourself. Try to have it as follows.



6. Remember: The leader's opinion doesn't count in the discussion. Keep your own view out of it. Your job is to get the ideas of others out for an airing.
7. If you see that some important angle is being neglected, point it out. "Bill Jones was telling me last week that he thinks. . . What do you think of that?"
8. Keep the spirits high. Encourage ease, informality, good humor. Let everybody have a good time. Foster friendly disagreement. Listen with respect and appreciation to all ideas, but stress what is important, and turn discussion away from what is not.
9. Take time every 10 minutes or so to draw the loose ends together. "Let's see where we've been going." Be as fair and accurate in summary as possible. Close discussion with summary--your own or the secretary's.
10. Call attention to unanswered questions for future study or for reference back to speakers. Nourish a desire in group members for continuing study and discussion through skillful closing summary.

Task J - Do in groups of 3-4

List other factors important to consider in planning for group involvement.

What are some factors that each group came up with? (List, group and label on board.)

From: Dr. Mike Giannmatteo

Read this and then in groups of 3 do Task I on next page.

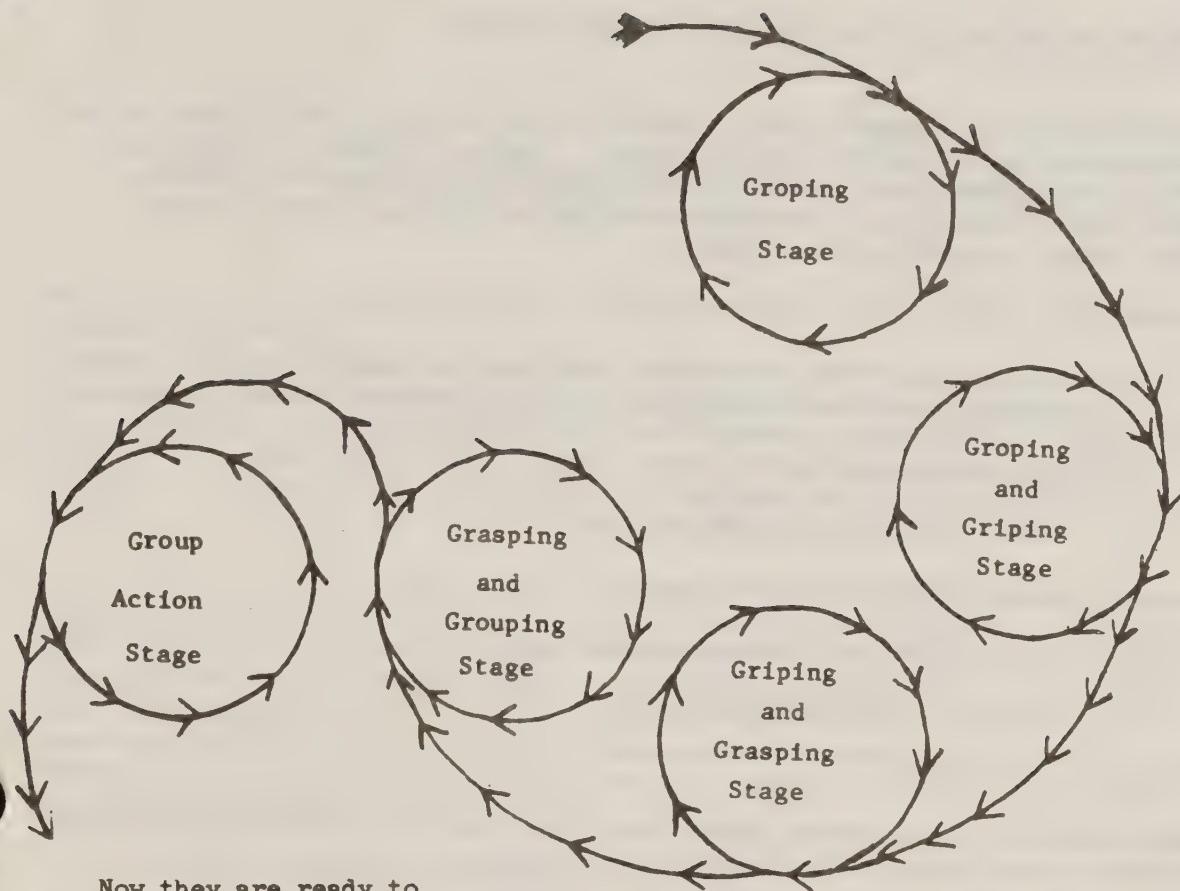
Every group has to spend time and energy learning how to work together. Usually some feelings develop between members while they are learning. It takes time for group members, each different, to learn how each can fit into the group and contribute best. So things often seem "all mixed up," and group members may quite naturally become disturbed and discouraged-- even aggravated at each other.

It helps to know that these are natural "growing pains" of democratic groups, that these feelings between members tend to follow a predictable cycle or sequence, and that in most cases the group will soon become productive and efficient as people work to solve group problems.

Let's take a look at the stages in this developmental process.

1. "Groping": When the group is first finding out how to plan and work together they may not all agree. They don't know and understand each other well enough to really trust the group, and they still have to determine each others' skills, knowledges, situation and attitudes. So they often feel uncomfortable and "lost."
2. "Griping": The group gets discouraged when they can't seem to work together, when there isn't much progress, and their attempts are frustrated. They say wrong things to others, play negative roles and block group action because they are uncomfortable. This is the place for more "self-other" understanding, to remember that they are all different but they all want to do a good job and be liked by others. Maybe they can learn to understand why others are griping, and learn to give themselves time to work things out.
3. "Grasping": Now ideas and suggestions are beginning to fit. The group begins to agree on questions, and can start to see some direction to group activity. Everyone begins to feel more comfortable and now they are getting somewhere.
4. "Grouping": They are really getting to know each other, and can understand and enjoy how each one works and fits into the tasks to be done. Group tasks, building and maintenance roles come into play, and a surge of enthusiasm spreads through the group.
5. "Group Action": Now the group is in full swing, with members playing constructive roles, leadership shared, everyone participating. It was difficult at first, but worth it to learn to work well together. They have shared in making plans and decisions, have learned together, and feel this is a good group with which to work. They are busy making their group more democratic.

On the following page is a picture of these feeling stages people go through together as they work at problems they all want to solve.



Now they are ready to tackle other jobs. It can be expected they will still go through some of these early stages, but each time it can be less disturbing, more effective.

So it is important to recognize how they feel about others in the group, to know that these feelings are natural whenever they really tackle important jobs, to realize that the group can move ahead toward better-feeling relations between members. As they get to know each other better, this group gradually becomes their group because they have shared plans and work, and have tried to practice ways of behaving which are cooperative, considerate, friendly--democratic.

TASK K

In small groups of 3, list examples of the different stages of group growth we have experienced during this week.

List the factors that might affect different stages of group growth.

V. IDENTIFYING THE ROLE OF THE FACILITATOR AND RECORDER

A facilitator is concerned that everybody feels included and accepted and he attempts to remain neutral on the content. The facilitator is trying to promote group responses, help the group generate their own data, develop a group value system, etc. He is not there to impose his interpretations, value system or answers on the group.

He should:

1. Suggest procedures for meeting and then get suggestions for change, commitment and acceptance from group to adhere to those procedures.
2. Keep the meeting on the topic.
3. Clarify and accept communication.
4. Accept feelings as valid data.
5. State a problem in a constructive way.
6. Summarize and clarify direction.

Task L

After reading the next seven pages, develop a list of criteria with two others to use in identifying and selecting a facilitator.

THE FACILITATOR ROLE
Topic Paper From Synergy

We have called the meeting leader a "Facilitator" to distinguish him from the typical "Chairman."

The fundamental difference between a Chairman and a Facilitator is the directiveness of the Chairman role. The Chairman makes rulings, determines procedures, rules people out of order, etc. The Facilitator proposes, suggests, invites and then consults with the participants to generate a consensus.

In general the Facilitator is more concerned that everybody feels included and accepted and attempts to remain quite neutral on the content. One way of viewing the Facilitator Role is that the Facilitator is trying to provide just enough structure so that the Relationship Level does not interfere with the Content Level.

Below is a list of things a Facilitator has to be concerned about as well as ways he can handle each situation:

1. Keep the Meeting focused on one topic:

Point out that the discussion has drifted. Usually the meeting will quickly return to the topic.

Re-state the original topic under discussion.

Example: "My understanding is that we were discussing..."

2. Clarify and Accept Communication:

Summarize the contribution of participants. In particular summarize the contributions of participants who have not been actively involved. "Your feeling is that..."

Relate one participant's idea to another. "If I understand it correctly, your idea would add to Mr. Smith's by..."

Accept incomplete ideas. "Could you develop that idea a little more."

Point out when a team member's contribution is cut off and invite him to complete it. "I'm afraid that we may have cut Mr. Jones off. Did you have more you wanted to contribute, Mr. Jones?"

3. Accept Feelings as Valid Data:

Summarize feelings as well as content. "You feel angry when..."

4. State a Problem in a Constructive Way so That the Meeting Can Work on it.

State the problem in such a way that it doesn't sound like blame-fixing or an accusation of the participants.

Send problems not solutions.

Help clarify the areas of decision-making. "As I understand it the Wilderness Act does not allow for development of recreation areas, however, it is open to us to recommend the classification of this land."

5. Suggest a Procedure or Problem-Solving Approach:

Point out when it may be useful to move on to the next problem.

"I'm wondering if we're ready to move on to...;"

Suggest a procedure.

"I'd like to propose that we might break into small discussion groups..."

6. Summarize and Clarify Direction:

Summarize your understanding of what the meeting has accomplished and indicate what the next steps will be.

7. In a Small Meeting the Facilitator May Also Play the Recorder Role.

See Topic Paper on Recorder Role.

BEHAVIOR THE FACILITATOR SHOULD AVOID:

In addition to the behavior listed above which an effective Facilitator will employ, there are also certain behaviors which the Facilitator should avoid because they will make his role impractical. The Facilitator will not be effective if he does not remain neutral, becomes a major participant in the content, manipulates the group through the use of his role, or uses his role to assert his own ideas.

Specifically the Facilitator should avoid:

1. Judging or criticizing the ideas or values of others.

2. Projecting his own ideas and using his role to argue for them. If you want to add your own ideas, make some clear identification that you are not making the comment as Facilitator -- "I'd like to take my Facilitator hat off for a minute and comment." If you get involved, though, it would be better to ask someone else to assume the Facilitator Role so that you are free to participate.
3. Making procedural decisions for the meeting without consulting participants.
4. Lengthy comments.

THE RECORDER ROLE Topic Paper From Synergy

The Recorder Role is a role which may be played by the Facilitator in a small meeting, but in a larger meeting should be handled by another individual.

The Recorder's Role is to record the contributions of the participants in a highly visible manner such as on a flip-chart or large sheet of butcher paper (a blackboard is ok if someone is keeping a permanent record from it).

Each participant's ideas and feelings are summarized so the whole group can see the summary. The Recorder attempts to record the statement as intended by the participant, but the participant may ask the Recorder to modify if needed.

In addition the Recorder should also record agenda items or agreed upon procedures.

The Recorder Role plays several important functions:

1. It accepts everyone's contributions by recording them.
2. It keeps the contributions very visible and helps people keep track of what has or hasn't been suggested.
3. It serves as a visibly agreed upon record of the meeting.

Like the Facilitator Role, the Recorder is a servant of the group. The Recorder tries carefully to record what he is hearing from the participants and avoids modifying what he writes to suit his own thinking. He must also be certain that if he is recording ideas he does not record only those ideas which he thinks to be productive. He must record them all.

SOME CONCEPTS OF LEADERSHIP

From: Dr. Mike Giannmatteo

I. WHAT IS LEADERSHIP?

A. MODERN DEFINITION

In basic terms, leadership is the activity of helping others work toward common goals or purposes.

Today, the expert in leadership is the one who best knows how to release the creative talents of those with whom he works. In earlier years, the expert in leadership was considered to be the one who best knew the answers. Now, terminology has changed from "directing and controlling" to "involving and motivating."

Leadership may be regarded as a series of functions that: (1) builds and maintains the group, (2) gets the job done, (3) helps the group feel comfortable and at ease (looking after physical setting, acquaintanceship, etc.), (4) helps to set and clearly define objectives, and (5) cooperatively working toward these objectives.

B. LEADERSHIP MYTHS

In earlier years it was assumed that leaders possessed certain special traits or characteristics. Many studies were made in an effort to correlate the leadership capacity or potential of an individual with these personal attributes. While some definable personal characteristics have been linked to leaders in certain situations, these studies haven't been successful in providing a formula for leadership selection. The modern concept is that leadership is functional or "job centered." We should ask then, "what does an effective agency do," rather than, "what kind of agency will be a good leader."

We have often heard the statement, "He is a natural-born leader." We know now that a leader in one situation may have very little leadership ability in another. A guide on a mountain climbing expedition might not be a very effective school board chairman.

C. THE ART OF SCIENCE OF LEADERSHIP

The ability to work effectively with groups in a leadership role can be learned through conscientious effort, study and practice.

It may truthfully be said that leadership is both an art and a science. The scientific principles are learnable. Therefore, any of us may do a better job of leadership if we understand and conscientiously practice some of these principles.

The art of leadership is the way in which we apply leadership principles. We know that there is variation among us in the manner in which we carry on any activity. This is apparent in such every day activities as playing a musical instrument, going to school, cooking a meal or even fishing.

In each of these activities as in leadership, learning and practicing certain principles will help but, of course, people vary in the degree to which they approach application. Students of human relationships have identified many functions or skills that are based on sound leadership principles.

D. SKILLS OF LEADERSHIP

The following are some of these skills that are important to learn and to practice.

1. Skill of personal behavior. The effective agency:
 - a. Is sensitive to feelings of the group.
 - b. Identifies self with the needs of the group.
 - c. Learns to listen attentively.
 - d. Refrains from criticizing or ridiculing members' suggestions.
 - e. Helps each member feel important and needed.
 - f. Should not argue.
2. Skill of communication. The effective agency:
 - a. Makes sure that everyone understands not only what is needed but why it is needed.
 - b. Makes good communication with his group a routine part of his job.
3. Skills in equality. The effective agency recognizes that:
 - a. Everyone is important. Everyone needs recognition.
 - b. Leadership is to be shared and is not a monopoly.
 - c. A leader grows when leadership functions are dispersed.
4. Skill of organization. The effective agency helps the group:
 - a. Develop long-range and short-range objectives.
 - b. Break big problems into small ones.
 - c. Share opportunities and responsibilities.
 - d. Plan, act, followup and evaluate.

SHARED LEADERSHIP

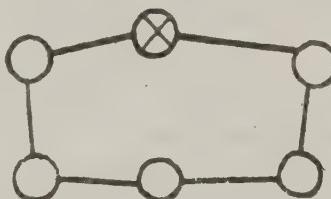
From: Dr. Mike Giannattao

- A. The appointed or "duly elected" leaders such as the chairman, president, boss or manager may exhibit autocratic, democratic or "laissez-faire" leadership. Some appointed or elected leaders feel that position of leadership entitles them to exhibit autocratic leadership--others strive toward democratic leadership but find that it often takes longer to get things done.
- B. The shared leadership role. This relates to a person whose behavior in the group helps keep the group happy and get the task done.

Group Leader

Is creative
Has good ideas
Open minded
Facilitates
Analyzes

Helps group work on task

Formal LeaderGroup Leader

Supports
Relieves tension
"Good fellow"
Dependable-liked

Helps meet needs of group

All members of a group should at some time or another provide this type of leadership.

- C. Advantages of shared leadership. Shared leadership is the ideal and it can only develop in a democratic leadership situation. Some of the values of shared leadership are:
 - 1. Pools the skills and abilities of the entire group.
 - 2. Promotes a spirit of unity--"my group" feeling.
 - 3. Each member feels a greater responsibility for group maintenance and task.
 - 4. Members are more interested--have a "stake" in goals and objectives that they help establish.
 - 5. Contributes to the growth and development of both members and leaders.
 - 6. Promotes a greater feeling of satisfaction as each group member shares in common achievements.
- D. The shared leadership concept requires:
 - 1. Clearly defined goals and objectives as identified and agreed on by the group.
 - 2. Freedom of group members from fear of criticism or ridicule.
 - 3. A warm friendly atmosphere--"permissive as opposed to directive."
 - 4. A setting where group members are socially at ease and physically comfortable.

SOME IDEAS FOR DEALING WITH GROUP CONFLICT

From: Dr. Mike Giammatteo

When there is "conflict" in a group--that is, a lack of democratic behavior between two or more group members--you will usually find it is "somebody" rather than an "idea" that is under attack.

In other words, people tend to say, "I don't agree with YOU," or "I think YOU are wrong," instead of "I don't agree with your IDEA," or "I think the IDEA you have placed before the group lacks merit."

Here are some things to keep in mind when dealing with a conflict situation.

1. Understand yourself and the other person(s).
 - a. Interpret your feelings--don't explode them.
 - b. Try to understand the other's situation, his point of view.
 - c. Try to get a "third-person" viewpoint, to see the situation objectively.
2. Keep improving your skill and power to express your position and feeling.
 - a. People know and understand you by what you do and say, not by what you "mean."
 - b. Watch what words you use. Do these words mean the same thing to both or all of you? An argument is often no more than a misunderstanding.
 - c. Work to communicate your real self and yet keep up the lines of communication.
 - d. Do not destructively attack the "self-concept" of the other person.
3. Get at the causes of the conflict, don't just look at the symptoms.
4. Be unto each other as persons--respect each other and trust each other.

A Partial Checklist of Tips for Facilitators

1. Listen to what your audience says.
2. Accept what your audience says.
3. Ask for reasons why.
4. Don't rephrase in your own words.
5. Plan sequences of questions.
6. Ask questions that allow greater responses.
7. Refocus on original question if discussion gets off subject and on a tangent.
8. Don't throw in your own opinions.
9. Don't ask multiple questions.
10. Allow time for audience response.
11. Ask lifting questions.
12. Don't restrict responses.
13. Encourage inter-person reactions.

Which of the above take more skill?

VI. IDENTIFYING DISCUSSION SKILLS

Many times we are at a loss to know how to keep a meeting moving or a discussion alive. By developing and using certain discussion skills we can raise the level of the discussion and increase the interaction among participants.

This section includes some discussion skills designed to help you deal more effectively with the comments and responses you get from the questions you ask.

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- C. REVIEW OF DISCUSSION SKILLS (Task)
- D. EXAMPLE OF HOW AN INTERPRETATION OF DATA QUESTION SEQUENCE AND DISCUSSION SKILLS MIGHT GO TOGETHER

This section is based on the philosophy developed in the course entitled "Higher Learning Thinking Abilities," developed at the Northwest Educational Research Laboratory. Special appreciation goes to Mr. Dick Phillips, Milwaukie, Oregon for his consultation and training in the development of Identifying Discussion Skills.

A. DISCUSSION SKILLS THAT MIGHT AFFECT PEOPLE'S FEELINGS, ATTITUDES, AND PARTICIPATION

Response to the person's feelings

The social-emotional climate of a group can facilitate or impede discussion. People tend to be cautious about exposing their ideas to value judgments of other people. The kind of climate that permeates a group can be judged on the basis of the accepting or rejecting behaviors exhibited within.

Each item on the list below is a possible response to a person who says,

- "Well, I still think you should put water faucets with climate."
- Rank order the responses from least to most accepting.
1. T Look at the other items under climate. Do water faucets fit?
 2. T Let's put it in this group. We can always change it if you want to.
 3. T There seems to be a difference of opinion. What do the rest of you think?
 4. T Can you change the label so water faucets would fit?
 5. T I think most of the group doesn't agree with you.
 6. T It really doesn't go with the other items.
 7. T All right.
 8. T Let's hold that idea for a minute and see if we can finish the other groups.
 9. T Let's listen again to his reason.

Here are some discussion skills important in promoting group participation.

1. Acceptance

A substantial portion of a facilitators replies are categorized as "response to the audience." Granted that all remarks are addressed to someone; but sometimes special attention must be directed to building a persons concept of himself as a worthwhile person. In the thinking tasks some specific strategies are suggested to establish a climate favorable to an open exchange of ideas without fear of rejection.

Chief among these are accepting behaviors. When a primary child, for example, interjects an announcement about his little brown dog, the teacher accepts his offering in one of a variety of ways and refocuses the discussion so the rest of the class doesn't get sidetracked. When a student does not stick to the question or is responding to an earlier question now that it is his turn, the teacher may skillfully tie his comment into the mainstream of the discussion or ask him to hold on to his idea, or simply acknowledge his contribution.

Identify the accepting response to the student in each pair:

1. a. We are not talking about differences.
b. You said the land was different. All right.
2. a. I'll write that down.
b. Which gold rush are we talking about?
3. a. How does this compare with last time?
b. That's an interesting idea.

NOTE: With practice even young children learn to speak to the point and demonstrate their awareness of holding to the focus through explanatory asides that precede their remarks, e.g.,
 "This isn't what you asked, but I want to say---"
 "Getting back to what Marcy said---"

Accept all responses in a non-judgmental manner. If you have set the groundwork for the freedom of group participation and discussion, it will be easy to accept all responses in a similar fashion.

Other ideas: O.K., Bill, any other ideas?; Thank you, Sue, any others? etc.;

Other comments, suggestions, or ideas:

2. Supporting

In any discussion the facilitator often responds to a person by supporting him. As a face-saver the teacher, for example, offers support to those students who have problems of entry into the mainstream of room interaction:

The child who is suddenly unable to respond when called on.
 The shy child who offers irrelevant information on his first attempt.

The unpopular child whose every comment is attacked by someone.
 The child whose ideas are always just given by the last speaker.
 Any child who needs a helping hand.

Select the supporting responses in each pair of the following:

1. a. Shall I come back to you later?
b. Who else has an idea about this?
2. a. I don't understand you, John.
b. Let's give John a chance to tell it his way.
3. a. Does someone have another idea?
b. I'm not sure about that. Maybe we could look it up later.
4. a. You can say it again if you want to. Maybe some of the boys and girls didn't hear Mary when she said it.
b. Do we have something like that up here, already?

In a supportive role, the most difficult aspect for the facilitator is handling errors. When a person makes an error of specific fact, the facilitator in his role of clarifier may ask another question to allow the person to correct the error by himself. Another way, if disagreement is encouraged routinely, is asking the group for a different point of view.

In each case the teacher refrains from direct correction to avoid drying up participation. When students become apprehensive about the reception of their thoughts, they will offer only the answers they consider pleasing to the teacher.

If a person's response, by its error or irrelevancy, shocks the questioner, it is wise to remember that anyone's head holds numerous "false" ideas, economic, political, historical, etc. They become apparent only when expressed verbally. If a person never opened his mouth, no one would know what "rights and wrongs" he has collected over the years. Getting the "wrongs" out into the open is one advantage of discussions. For example, if a large segment of the group displays serious misunderstandings about climate, the facilitator can plan learning activities to rectify the mistakes. Just identifying a persons response as wrong does not correct it for that person or for any other person. Corrections that come from a person's own experiences are much more effective.

One of the experiences acceptable to most people is friendly disagreement with one's peers. Summoning defenses for different points of view is beneficial to thought development also. Facilitators skilled in discussion, encourage active participation through this device of seeking differences of opinion and inviting everyone to express his views. Disagreement is particularly fruitful if there is no pressure for closure, no voting, no concern when an impasse is reached. A side benefit accrues to people who learn early that in some areas there are no easy answers, no one "right" conclusion, only differences in the way people process the available data.

Other ideas:

- "Take a minute to think."
- "Go ahead--express it in any way that you can."
- Avoid editorializing--
(Nonverbal support) Wait, don't rush the response.

Other comments, suggestions, or ideas:

3. Rewards

This is a subtle area, but certain guidelines can be followed.

- a) Don't get in the pitfall of rewarding one person and not another. Don't play favorites.
- b) The "tone of expression" is very important. Avoid the "over-reward"--the overly explicit, overly-generalized reward.
"Excellent, Bill! Wonderful, tremendous work, very good!"
"Marvelous thinking, Jim!"

This type of reward has the effect of binding, rather than freeing the discussion. Many persons will be reluctant to respond for fear they won't receive it.

- c) The most effective rewards are an implied acceptance of the person and his ideas.
- d) Incorrect responses need to be handled in a manner which accepts the person, but rejects the content.
"Thank you Johnny, what type of information would we need to check out your theory?"

Rewards relate back to the supporting discussion skill.
Other comments, suggestions, or ideas:

4. Encouraging

Encouraging participation is another form of response to a person's feelings. Involvement assists a person to feel he is an adequate, worthwhile member of the group. If a person is reluctant to enter the fray, he can be invited to disagree, recap, summarize, or just jump in and contribute.

Choose the response that seems most likely to be encouragement rather than any of the other types of responses.

1. a. Has everyone had a chance to say what he thinks?
b. Let's go on to the next column.
2. a. Does someone want to disagree?
b. All right.
3. a. Why does this information help us?
b. Do you want to run through that information again, sort of pull it together for us before we go on?

Other comments, suggestions, or ideas:

5. Tone of Expression

The emotional overtone of a question or response to a question can either encourage or inhibit participation.

L - "What industries would we find in the Yukon?"

P - "Trapping."

L - "All right. What else?"

P - "Silver mining."

L - "Very good, Johnny!" ("You guessed what was on my mind.")

Such an exchange is likely to inhibit people who do not feel that they are very good at guessing what is on the leader's mind.

Other comments, suggestions, or ideas:

6. Restricting Words

Often we inadvertently use words which, in themselves, restrict or distort the openness of the discussion.

"What important things did the film show us?"

(Now the person has to guess what you think is important)

Get in the habit of writing down the major questions ahead of time. This does two things--you put the question on paper and you can analyze it ahead of time to weed out restricting words. If you have the question on paper in front of you there is less chance to "ad lib" and throw in extra words you hadn't planned on.

Other comments, suggestions, or ideas:

7. Polly Parrot

POLLY PARROTING is a common pitfall of many people leading group discussion. It detracts immensely from the effectiveness of the leader and the discussion.

This is when the leader repeats everything each person in the audience says.

L - What did you just see?
 P - A hawk.
 L - A hawk, did anyone see anything else?
 P - A dove.
 L - A dove, did anyone see anything else?
 P - A deer.
 L - A deer, anything else?
 Etc.

Implications of Polly Parroting

- a) teacher - student - teacher - student relationship.
- b) no one has to listen to anyone but the teacher because everyone knows the teacher will repeat everything.
- c) no one has to speak out loud so everyone can hear.
- d) restricts group interaction.
- e) we become a group of mumblers.

Some ideas on how to correct being a Polly Parrot

1. Recognize if you are one. Many people don't realize they polly parrot until someone tells them.
2. A simple technique to overcome polly parroting is to ask the person to say it again, so everyone can hear. Refuse to repeat the response. Ask them to repeat it three times if necessary.
3. Accept the response and do not say anything. By your non-verbal behavior, indicate you're open for additional comments.
4. Say "thank you, any other comments?"
5. But what if someone says something in a teeny voice nobody can hear? Ask them to repeat what was said.
6. And what if they say it in the teeny voice again? Ask people on the other side of the room (or farthest away) if they were able to hear what was said.

After all, the group is supposed to be talking to each other, not the discussion leader. By throwing the responsibility back to the group members, you'll keep the discussion from being leader-entered.

Other comments, suggestions, or ideas:

8. Leading Questions

A leading or loaded question suggests how the leader wants the group to answer. This type of question reveals the leader's own feelings and value system. The leader cannot trust the validity of the information because he has already suggested what answers he wants.

"It would be a good idea to pave that street, wouldn't it?"
"Of course the best way to do it is to walk to work, right?"

Leading questions restrict open discussion because the audience has to decide what to answer to gain acceptance from the leader.

Other comments, suggestions, or ideas:

9. Loaded Questions

A loaded question traps a person. The audience is caught no matter how he answers.

"Have you stopped throwing your garbage?"
(Yes I have or No I haven't---He had to admit that at least once he threw away garbage)

"When are you going to stop being so stubborn?"
(This also restricts open discussion because nobody wants to be put on the spot)

Other comments, suggestions, or ideas:

B. DISCUSSION SKILLS THAT MIGHT AFFECT THE COMPLETENESS AND RELEVANCY OF THE SUBJECT BEING DISCUSSED

1. Multiple Questions

In our enthusiasm to emphasize the importance of a question, we often elaborate with additional questions, and end up by switching the focus from the original, intended question.

"Who was the person with the most feeling in the story?
Think of the characters and their experiences. Which one had the most interesting experiences?"

This syndrome is usually caused by not writing down (ahead of time) the questions you are going to ask.

If you ask a question and people just sit there and look blank, relax--wait and say nothing (people usually need time to think). If someone says I don't understand, don't rephrase the question, read the same question again.

Other comments, suggestions, or ideas:

2. Time to Think

A most important element in any discussion is allowing time to think. Many people have an incapacity to tolerate silence. Thinking processes are sometimes slow and painful. Wait for a response. When a prolonged silence ensues, support the person.

"Would you like to keep working on your problem, or would you prefer to call on someone else to help you?"

If he decides to resolve the problem himself, be certain to call for his response when he has finally reached a solution. The same procedure may be followed when a student says:

"I know what I want to say, but I can't say it."

Some ideas on how to correct

Important! Ask a question, then wait--wait--wait.
Keep your mouth shut.

If you wait two minutes and nobody has said anything yet, repeat the question exactly as you said it the first time. Wait.

Other comments, suggestions, or ideas:

3. Extending

Obtaining as much information as possible. Use as means to give people more time to think.

The extending question pushes for factual elaboration in response to the content of a comment. You might be probing for alternates, additions, analogies, and explanations mainly on the same level of the student's contribution. There is no striving to boost the discussion upward, only forward through expanding on what has been offered.

Select the extending question from each pair below.

1. a. Shall I write this statement on our list?
b. Who can add to this statement?
2. a. Can you think of any other differences?
b. Can we finish with differences now?
3. a. Are there any other workers that would be needed?
b. Why are workers needed?
4. a. Can you tell me some more about soil erosion?
b. What does the word erosion mean?
5. a. Which plays are you talking about?
b. Maybe, if you think of the play we discussed last week, you can explain today's plot.

"Is there anything else that you would like to mention?"
"Any other ideas?"

Other comments, suggestions, or ideas:

4. Clarifying Content

The person expresses a concept which may not be clearly understood, either by him or the group. He is asked to clarify his meaning.

Asking for clarification is one way to respond to content. The clarifying question elicits the meaning of unfamiliar terms or the rephrasing of disconnected, fuzzy statements, to be sure you understand what the person means. This role also helps to clarify meaning for the rest.

In the pairs of questions below, which one fits the criteria for seeking clarification?

1. a. What do you mean by evaporation?
b. Have we talked about evaporation already?
2. a. I'm not sure I understand. Can you say that another way?
b. Do you all agree with this?
3. a. Why is climate important?
b. Can someone help us with a definition of climate?
4. a. Are you saying the Aztecs had fertile soil?
b. Which Indians had poor soil?

"Can you be more specific?"
 "What do you mean by customs?"
 "Can you say that in another way?"
 "Can you give us an example?"

Other comments, suggestions, or ideas:

5. Focus and Refocusing

Focus questions are defined as the initiators of major shifts in a discussion, the three to five preplanned questions that pace and support the direction of thinking.

In the statements below, underline just the words that set the focus for students:

1. What I want you to do today is to look at the chart. Let's start by looking at the first two columns on the chart. Can anyone say anything that would be true about all these products?
2. Our list is long enough. Could some of these be grouped together? Which items could you put together?
3. If you had been the boy everyone called names, how do you think you would have felt?
4. Let's look at our chart for ways these animals are alike, no more on differences.
5. Who can summarize all that we have talked about in one sentence?

Sometimes in setting a focus a teacher inadvertently poses a double focus. What disadvantages can you see in the following focus?

"What can you say about these people after seeing the film; what would you expect to find if you went to Mexico?"

Refocusing is essential at times, especially for people who wander off the track easily. The focus question may be repeated, or written on the board. Rewording may be necessary to start the flow of discussion if the original phrasing is misunderstood by those attempting to respond. Most refocusing is related to maintaining the discussion of the topic.

Which three of the following are clearly attempts to refocus the discussion?

1. Can someone summarize our discussion?
2. What I meant was, what differences do you see on these two graphs, not the ones from yesterday?
3. Are some of you thinking of the second experiment? Let's think of the first one and tell me what happened.
4. Which group of Indians used floating gardens?
5. Why were floating gardens necessary?
6. Let's hold that and continue with differences on our chart.

Other ideas:

"Now what were we discussing a moment ago?"

"How does that relate to the subject?"

Other comments, suggestions, or ideas:

6. Lifting

The skill of lifting the level of the discussion is the most difficult one to learn and one most often overlooked by a facilitator trying to master all the roles in a discussion. It is classified with the focusing questions because it, too, plays a role in raising the level of mental operation through seeking causality.

Discussions that are disappointing to a facilitator are often the result of not pursuing the "whys" with persons who almost, but not quite, discover broad generalizations. The designed focus questions are intended to lift the discussion away from the concrete, but people do not necessarily think according to a model. Between the patterned lifts there are unplanned, unforeseen occasions for abstract thinking if the facilitator recognizes the moment and inserts a why-type question. Seizing these opportunities to lift the level of discussion reflects a facilitator's skill. Individual lifting questions cannot be prepared in advance because the direction of any one student's contribution is unpredictable. These are the automatic questions for pursuing thinking with one person. Through one or a series of questions the facilitator assists a person to build a chain of relationships that may or may not end in a generalization or inference.

- Which question in each set attempts to lift the level of thinking?
1. a. Are you saying that riots will affect our laws?
b. How might riots affect our laws?
 2. a. Why is the Fourth of July a holiday?
b. Why do we have holidays?
 3. a. Could you explain further?
b. How do you account for that?
 4. a. Why do you think this is a good conservation practice?
b. Can you explain this conservation practice?
 5. a. Why do you suppose Macbeth changed?
b. What changes in the characters did you notice?

7. Summarizing Content

When a person elaborates on an idea at great length, or the meaning of his statement is buried in an extended discourse, he is asked to state it in a more succinct manner.

"How can we put what you have just stated on the board?"
"Can you give us the main idea of what you are saying?"

The summary questions used at the end of certain tasks and at the end of the session are one of the most exciting and important parts of each lesson. These questions are designed to:

1. ALLOW PARTICIPANTS TO DISCUSS THE IMPLICATIONS OF WHAT THEY LEARNED TO THE MANAGEMENT OF THE ENVIRONMENT.
2. ALLOW PARTICIPANTS TO GENERATE THEIR OWN CONCEPTS AND GENERALIZATIONS ABOUT WHAT THEY HAVE DONE.

"How can we summarize all the things we've done and discussed in one or two big ideas?"

"How can we summarize our discussions and investigations about water?"

Other comments, suggestions, or ideas:

RECAP

A facilitator responds to the PARTICIPANT through

accepting
encouraging
supporting

Also considering such things as rewards, restricting words, polly parrot, leading loaded questions.

A facilitator responds to the completeness and relevancy of the subject being discussed through

clarifying
specifying
extending
focusing
refocusing
lifting

Also considering such things as: multiple questions, time to think, summarizing content.

Other comments, suggestions, or ideas:

REVIEW OF DISCUSSION SKILLS

Write in the appropriate skill in front of each question.

A. Discussion skills that might affect peoples participation (Accepting, encouraging, and supporting)

1. _____ You said the land was different. All right.
2. _____ Let's give John a chance to tell it his way.
3. _____ Has everyone had a chance to say what he thinks?
4. _____ Shall I come back to you later?
5. _____ That's an interesting idea.
6. _____ Does someone want to disagree?
7. _____ You can say it again if you want to. Maybe some of the boys and girls didn't hear Mary when she said it.

B. Discussion skills that might affect the completion or relevancy of the subject (Focusing, refocusing, and lifting)

1. _____ Let's hold that and continue with differences on our chart.
2. _____ How do you account for that?
3. _____ Why do you suppose Macbeth changed?
4. _____ Our list is long enough. Could some of these be grouped together? Which items could you put together?
5. _____ Are some of you thinking of the second experiment?
6. _____ Let's think of the first one and tell what happened.
7. _____ Why do you think this is a good conservation practice?
8. _____ Who can summarize all that we have talked about in one sentence?
9. _____ Which of these groups wanted change?
10. _____ What do you mean by evaporation?
11. _____ Are there any other workers that would be needed?
12. _____ Are you saying the Aztecs had fertile soil?
13. _____ Can you think of any other differences?
14. _____ Which workers on the list are you thinking of?
15. _____ I'm not sure I understand. Can you say that another way?

C. Teacher responses to the person or to the content

1. _____ Let's listen again to his reason.
2. _____ Which Indians are you talking about?
3. _____ Does anyone want to add to this statement?
4. _____ Now do some of these items seem to go together?

C. EXAMPLE OF HOW AN INTERPRETATION OF DATA QUESTION SEQUENCE AND DISCUSSION SKILLS MIGHT GO TOGETHER

Type of Question	Objective or Purpose of Question	Examples of Discussion Skills you might use (or what you do with the response you get from the audience)
Open	<ol style="list-style-type: none"> To elicit a universe of facts, concepts and ideas upon which to operate. To provide an opportunity for every person to become initially involved in the discussion. 	Accepting Supporting Extending
Focus	<ol style="list-style-type: none"> To focus on specific points to be compared, contrasted and related to other points. You may have to focus in on several specific points, needed to compare, contrasted in the interpretive questions. 	Focus Clarifying Extending Lifting
Interpretive	<ol style="list-style-type: none"> To compare, contrast and relate specific points brought in the focus question(s). Questions (or series of questions) which call for the students to draw a relationship between two or more points in the data. 	Focus Clarifying Extending Lifting
Capstone	<ol style="list-style-type: none"> To move the discussion to the verbalization of high-level abstractions. Questions that call for conclusion, generalization or summary. 	Time to think Summarizing

VII. IDENTIFYING DIFFERENT GROUPING ACTIVITIES

From: Dr. Mike Giamatteo

Mini-Market

Talking about reason for meeting (10-15 minutes)

Station personnel at prepared displays to tell part of story. Keep audience moving in 10-person sized groups (30 minutes)

Have factual sheets -- Historical
Current
Future ($\frac{1}{2}$ sheet blank)

Example:

How much land
Cost to taxpayers
How many jobs come from the land
Lumber sold
How many visit, use, etc.

Have participants fill in their ideas about the future of the issue/area of concern. (15 minutes)

Issue Analysis -- Short version Use 3 X 5 Cards

Questions to ask:

1. What concerns do you have about forest land management?
What concerns do you have about this area of land?
What concerns do you have about this issue?
Write two concerns on your card--
(5 minutes)
2. What ideas do you have to reduce or eliminate the concerns noted?
List those on your card---
(5 minutes)
3. Get into groups of 6 people and---
 - a) see if there are any common concerns
 - b) common solutions

Make a groups list of---

 - a) common concerns
 - b) common solutions
4. Turn into meeting coordinator for compilation, reproduction, and dissemination to all people at meeting.
5. Meeting coordinator announces that all participants at this meeting will receive compiled list, names of all participants, and date of next meeting.

ABC EXERCISE

Preparation and Training--
Dr. Mike Giannattao

Problem--Helper--Observer

Whole idea of communication is the way we:

- Share ideas (sending messages)
- Listen (receiving messages)
- Feedback (to tell how well you send or receive messages)

1. Pass out (at random) cards marked A, B, or C---one to each person.
2. Ask each person to write (on card) one problem or concern (dealing with public involvement or a real concern pertaining to a job, etc.). (take 3 minutes to do this)
3. Then ask the people to break into groups of three (one A, one B, one C). (Ask them to get with someone they usually do not work with).
 - a) A will be the first to state his problem (he has written).
 - b) B will act as Helper or Advisor.
 - c) C will act as Observer to Give Feedback. (Take notes on: how well A has stated problem and is receiving help; how well B is helping and advising).

This should take six minutes, with one minute for feedback from C.

4. Switch roles:
 - a) B states problem.
 - b) C acts as Helper/Advisor.
 - c) A acts as Observer.

This should take six minutes, with one minute for feedback from A.

5. Switch roles:
 - a) C states problem.
 - b) A acts as Helper/Advisor.
 - c) B acts as Observer.

This should take six minutes, with one minute for feedback from B.

6. Ask one person from each table (or group) to collect the problem statements and remain another 15 minutes or so to help regroup and list these concerns. This list of concerns would then be passed on or mailed to each participant.

Remind participants: We collected your name and address as you came in so we could mail this information to you.

7. State what further involvement and input might be needed from participants

From: Dr. Mike Giannmatteo

Option #1:

At a group meeting, distribute 3x5 cards to each table or area.

Ask that any time anyone has a concern or a question (either about the activity being done, or its implications), write that question or concern on one of the cards.

Cards may either be:

dropped in a designated box

placed in a designated spot on the table

Mention that cards will be collected at pre-arranged time intervals throughout the meeting.

Each card will be read, and the leader and/or group will react to those questions or concerns.

Option #2:

At a group meeting, distribute 3x5 cards to each person.

Ask that each person write down some question or concern above _____ (whatever the case may be).

Cards will be unsigned, collected, and read to the entire group.

As each card is read, the leader and/or group will respond to the questions and concerns.

Concern Card Analysis

People have a need to be recognized.

It's easier to respond on 3x5 cards.

*It helps the leader understand the needs of the group. (He has information about general and immediate concerns.)

Enables leader to help people help themselves, and still allows people the opportunity to express their immediate concerns right now and know that their concern will be dealt with during the session.

Builds confidence and trust in the leader--he wants to know your concerns, but he also wants you to gain some skills (long range) so he provides a way for both to happen.

Implications:

Prevents the 'axe-grinders' from dominating the meeting.

Prevents 1-2 people from 'venting' concerns that are not concerns of the majority of the group.

People have to put their concerns and questions down in writing so they can't use the pretense of 'asking a question' to give a 15-minute speech!

People have a chance to clarify their own questions or concerns by putting them down in writing.

Charges--Denials--Facts

From: Dr. Mike Giannattac

In this case you acknowledge that the concerns have been identified.

People need a chance to 'vent'--so you provide it in small groups.

(Don't be afraid to get people into groups and even the odds. Reduce the input to an honest level).

CHARGES	DENIALS	FACTS

Directions:

Reduce the number of charges to 2-3 you feel most important.

List the denials identified by individuals or groups concerning the charges.

List the factual data (or its source) concerned with each of the items in 'Charge-Denial.'

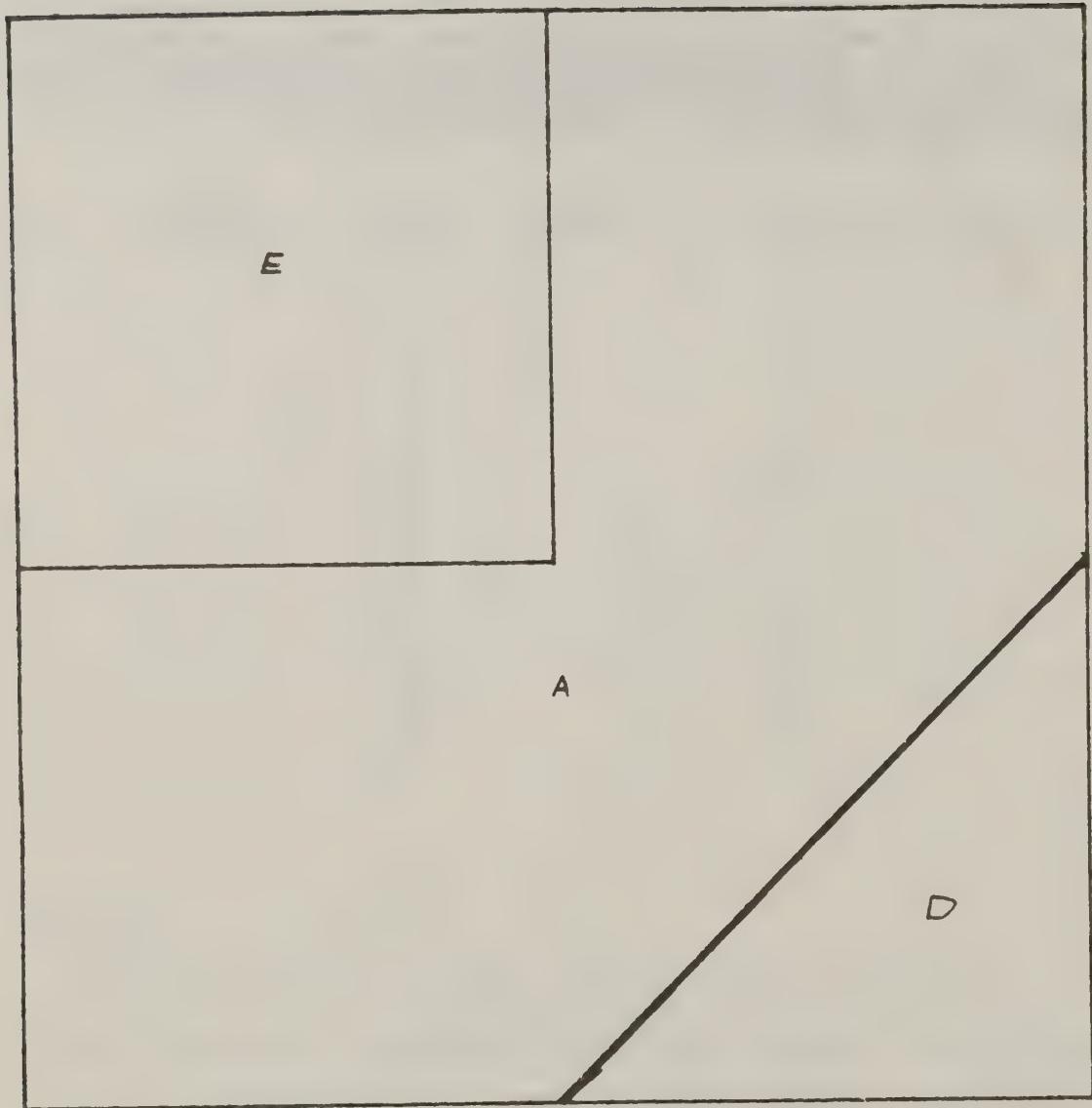
(If the facts are not available, state what plans exist for obtaining those so charges and denials by opposing groups may be verified)

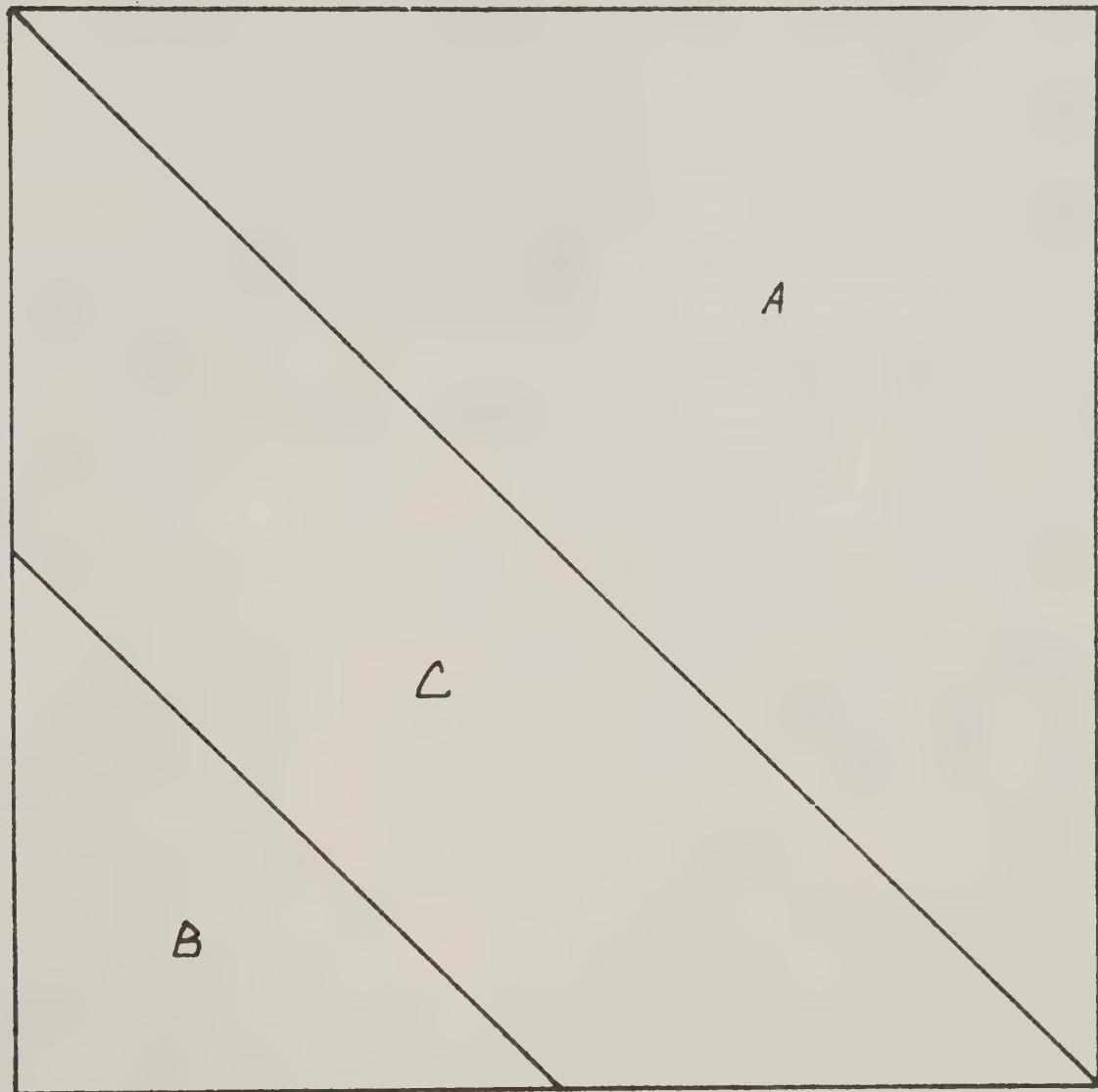
Try to neutralize the agency role and throw the responsibility onto the participating groups.

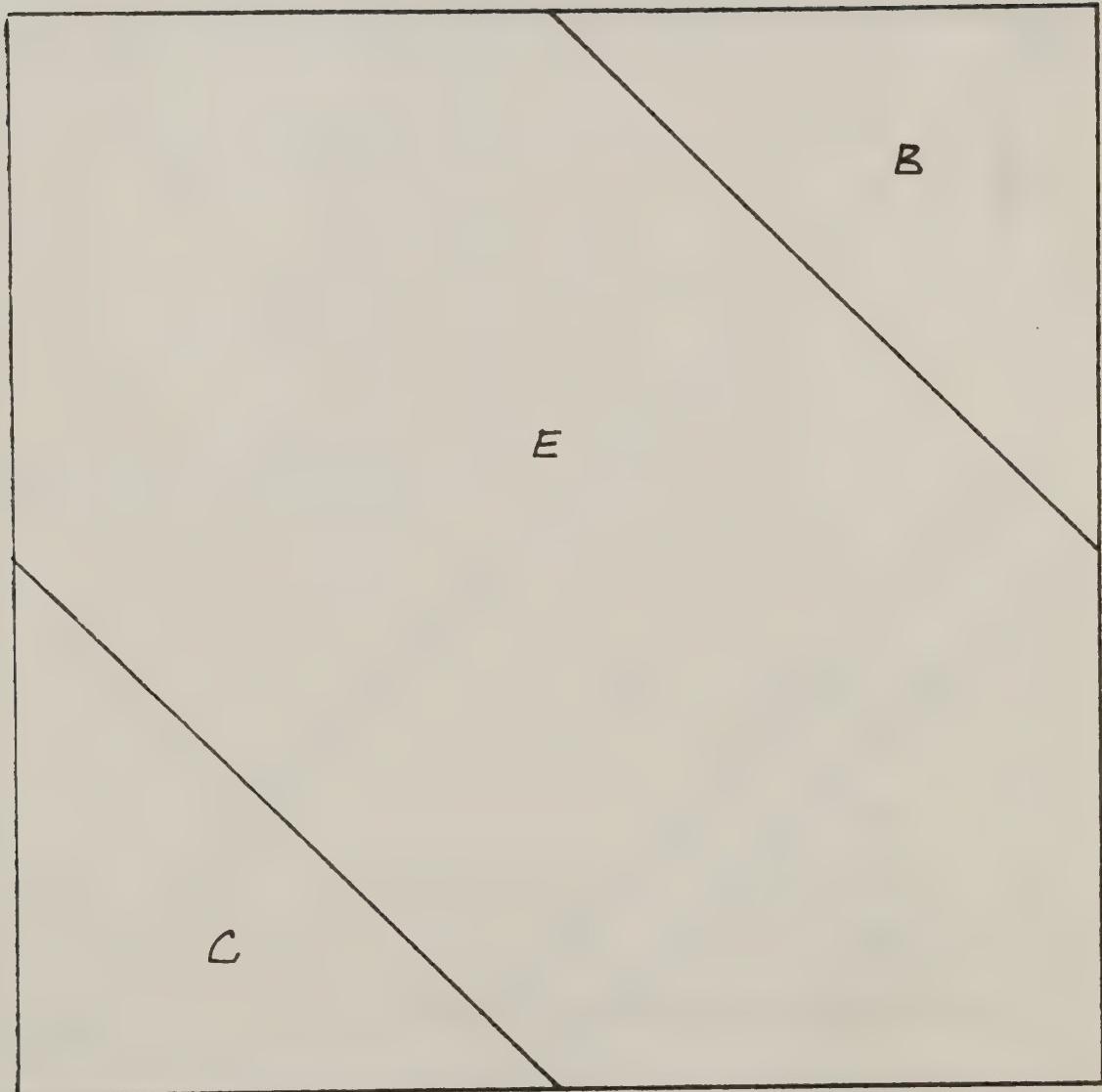
VIII. DEVELOP A PLAN OF ACTION FOR CONDUCTING A MEETING

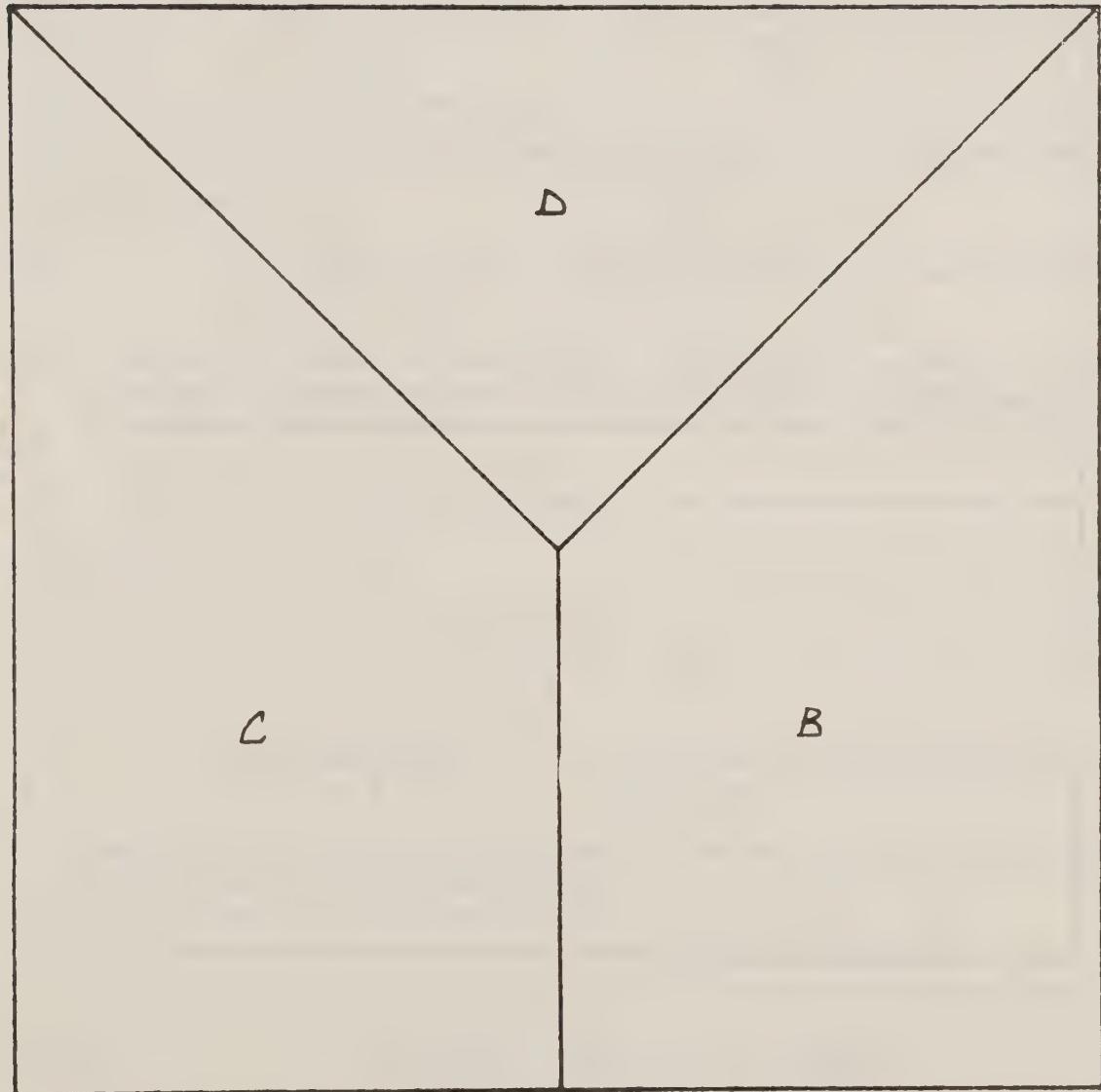
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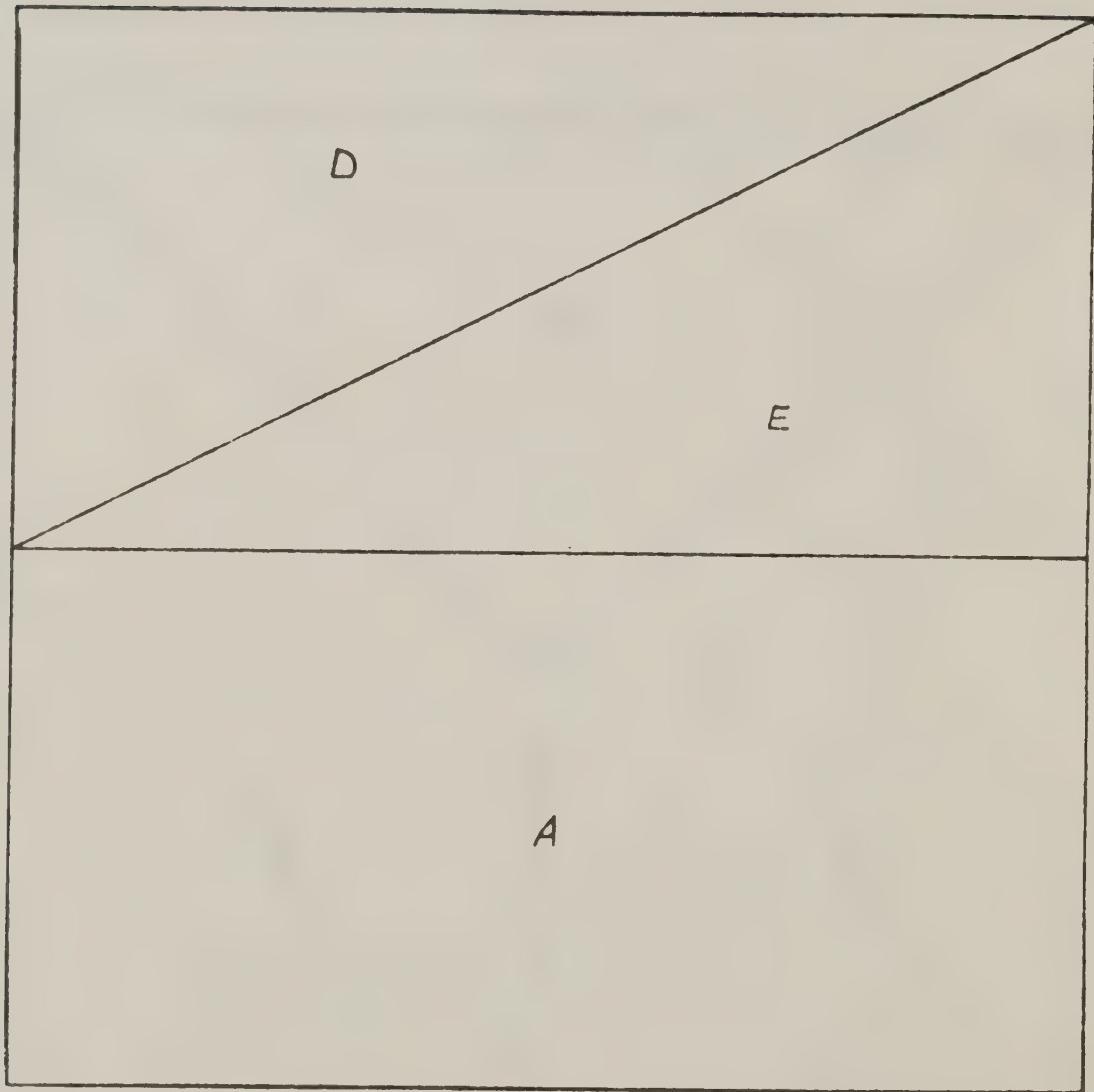
Based on the things we've done, discussed and read, develop a meeting format that will define the objective of the meeting, type of meeting, maximize total group participation, minimize polarization of participants, and will allow for the highest quality usable input. (Work in groups of 3-4.)











PLACATOR

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- ° You are to play the placator role in solving the following problem

- ° The Problem:

It is 90° outside - your group has to decide whether or not to go on a picnic - it is 2:30 p.m.

- ° Examples of Placator--always soothes over a discussion
"Everything in due time"
"The sun will shine tomorrow"
-

ATTACKER

- ° You are to play the attacker role in solving the following problem

- ° The Problem:

It is 90° outside - your group has to decide whether or not to go on a picnic - it is 2:30 p.m.

- ° Examples of Attacker--always attacks ideas presented or will be negative.
"You know the administration will never go along with that"
"People don't care, our group would never do that without pay!"
-

IRRELEVANT

- ° You are to play the irrelevant role in solving the following problem

- ° The Problem:

It is 90° outside - your group has to decide whether or not to go on a picnic - it is 2:30 p.m.

- ° Examples of Irrelevant--ideas given that do not relate to the topic (evader).
"Did you see the movie last night?"
"Who's bringing the coffee for the next meeting?"
-

SENSIBLE

(YOU ARE TO START THE DISCUSSION)

- ° You are to play the sensible role in solving the following problem

- ° The Problem:

It is 90° outside - your group has to decide whether or not to go on a picnic - it is 2:30 p.m.

- ° Examples of Sensible--always tries to be as sensible as possible.
"Let's review where we are!"
"Why don't we get back to the purpose of the meeting!"

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DEVELOPING AN ENVIRONMENTAL EDUCATION ACTION PLAN

If a man is to develop an increased understanding about his relationship to his environment and how to take positive action for its improved management, then it is important to plan for a series of logical and comprehensive environmental learning opportunities that relate to his needs and the needs of society and the environment. These learning opportunities might be a part of an overall plan, and should reflect school through general public environmental education experiences.

It is important to evaluate how and where each person can make his or her most important and efficient contribution to environmental education. It might be establishing a local environmental education council, developing and conducting a teacher's workshop, planning a schoolyard laboratory or conducting public meetings to receive public input on land management issues.

The information and planning sheets in this booklet can be useful in developing parts of your action plan.

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Putting the Plans Together	33
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DEVELOPING AN ENVIRONMENTAL EDUCATION ACTION PLAN FOR YOUR AREA

Inventory:

Do you have an Environmental Education Committee or equivalent in your community?
Does it include a cross section of community people?

List the existing environmental programs in your area.

Which ones are process and action oriented?

Do they range from Kindergarten to adult education?

What voids are there?

List the environmental areas used as classrooms.

List the additional ones that could be used.

What environmental education teacher and resource people workshops have been held
in your area in the past two years?

What type of environmental education workshops or meetings have been conducted or
are being planned for community people in your area?

ENVIRONMENTAL EDUCATION COUNCILS

Environmental education councils have been successful in planning and implementing programs in many areas. You may already have a committee or council that is concerned with some aspect of an environmental education program such as the County Conservation Day Committee. It may be a simple matter to enlarge the committee's membership to include more educators and resource people and to broaden the existing committees objectives and program. Objectives of such a council is usually concerned with the implementation and coordination of environmental education programs with the existing school program.

WHO SHOULD BE ON THE COUNCIL--

The council should consist of educators and resource people who can exchange ideas and activities to enhance the development of quality school programs. Members should include, but not be restricted to, County School Superintendants, School District Superintendants, building principals, Curriculum Directors, classroom teachers, County Extension Agents, Resource agency and private organization representative civic group representation, park and recreation district representative college people, news media, etc.

WHAT CAN THE COUNCILS DO--

1. teacher workshops
2. Help plan and develop on-site schoolyard classrooms and activities
3. build self-guided nature trails
4. develop conservation teaching aids and activity sheets
5. provide coordination and dissemination of teacher requests in environmental education programs

SOME STEPS IN ORGANIZING A LOCAL COUNCIL--

1. Invite a few key interested educators and resource people to a meeting to explore the possibility of establishing a local environmental education council.
2. If the group agrees to the need for a council, then set up a planning subcommittee to decide on who to invite to the organization meeting, develop the program agenda, time and place. (Invitees should be those people that the planning committee identifies as action-type people who will get job assignments done).

The program might include some knowledgeable speaker who has had experience and can orient the group to the environmental education job in the schools and identify specific action jobs the committee can do to be effective. Don't get tied up in a lot of philosophy.

3. Hold meeting and have discussion on the needs and concerns in environmental education. (Have recorder take down pertinent ideas, existing programs, examples of programs elsewhere, new programs needed, contributions of manpower, materials, etc., offered, etc.).

Appoint temporary chairman and secretary. Chairman should appoint an ad hoc committee to digest meetings discussion and formulate a short report for the next meeting giving action recommendations for the direction of the group. Recommendations should be specific and relevant.

4. Have a second meeting one month later to discuss recommendations. (Mail out ahead of time), changes or additions. Adopt committee charter and subcommittee assignments. (Every person of the council should be assigned to a subcommittee or given some task). Decide upon the first project the committee wants to undertake. It should be short, easy to plan, outside and assured of success. Examples are: one-day teachers' workshop on a schoolyard or along a nature trail; taking school administrators and school board members on a resource management show-me trip; helping a principal plan an outdoor laboratory on a schoolyard, etc.
5. Continue montly meetings or regular meetings as needed.
6. Hold first project, have news coverage.
7. Continue to work with the educational community in as many ways as possible to enhance the educational experience in the schools.
8. Plan on having at least one or two activities involving the public schools each year.

EXAMPLES OF EXISTING COUNCILS--

1. King County Environmental Education Council, Seattle, Washington.
2. Kittitas Conservation and Outdoor Education Council, Ellensburg, Washington.
3. Chelan-Douglas County Conservation and Outdoor Education Council, Wenatchee, Washington.
4. Snohomish County Environmental Education Council, Everett, Washington.
5. Pierce County Conservation and Outdoor Education Council, Puyallup, Washington.
6. Clark County Environmental Education Council, Vancouver, Washington.
7. Metropolitan Outdoor Education Council, Portland, Oregon.
8. Lane County Conservation and Outdoor Education Council, Eugene, Oregon.
9. Jackson County Conservation and Outdoor Education Council, Medford, Oregon.

Contacts for these councils can be made through the following:

Mr. David Kennedy, Environmental Education Consultant, Superintendant of Public Instruction's Office, Olympia, Washington.
Bus Nance, Environmental Education Consultant, Oregon Board of Education, Salem, Oregon.

SUGGESTED SUBCOMMITTEES AND JOBS FOR COUNCIL TO IMPLEMENT

I. Environmental Learning Area Subcommittee-- (see page 10 for additional information)

- Review by-law objectives C and D and suggest tangible ways in which they may be implemented.
- Assist schools with evaluation and development of potential outdoor classrooms. These include schoolyards, parks, natural areas, etc.
- List major problem areas we should consider for next year.

II. Teacher Training Subcommittee-- (see page 23 for additional information)

- Review by-law objective E and develop and coordinate one-day environmental education teacher workshops.
- Disseminate information on conservation workshops and scholarships to teachers.
- Explore role of educational television in teacher training.

III. Curriculum Integration Subcommittee-- (see page 31 for additional information)

- Evaluate major problems in environmental curriculum planning.
- Plan how by-law Objective F best be accomplished.
- Work out method of placing conservation education material currently available in school libraries within area.

IV. Educational Tours Subcommittee--

- Review by-law Objectives C and D and suggest ways in which educational tours offered by various private and governmental organizations can help achieve these objectives.
- Make listing of existing tours available to school. Suggest how this listing may be best distributed to school administrators.

V. Extension Subcommittee--

- Suggest ways of implementing by-law objective G.

VI. Coordination of Requests--

- Review by-law D and explore ways of coordinating school requests for environmental materials and resource people.

EXAMPLE OF ONE SET OF OPERATING GUIDELINES

1. This council will be known as the "King County Environmental Education Council."
2. Council Objectives:
 - A. To provide for the wise use of natural resources through environmental education programs.
 - B. To provide a forum where educators, resource managers, and other interested citizens can share concerns and information in the area of resource use education and seek cooperative solutions to their common problems.
 - C. To provide environmental educational experiences for our country's youth.
 - D. To coordinate requests from schools for resource people to assist with field trips, conservation projects, development of school sites and similar educational ventures.
 - E. To foster training for teachers in environmental education through local in-service programs, teacher workshops, and educational television.
 - F. To assist schools in integrating environmental education into their curriculum, Publications, bibliographies, scope and sequence charts, and other conservation teaching aids.
 - G. To act as a liaison with other environmental education committees, the Natural Resources Forum of Washington, Conservation Education Association, and other groups dedicated to furthering the wise use of our natural resources.
3. The council will be composed of interested representatives and/or individuals from citizen groups, education, industry, government and others who support the objectives of the council.
4. The council will meet monthly. Special meetings may be held as needed.
5. Council officers will be chairman, vice-chairman and secretary-treasurer. They will be elected by majority vote at the Spring meeting and serve one year. Officers will rotate: when the chairman completes his term, he will be replaced by the vice-chairman, and the secretary-treasurer will become the vice-chairman. Thus the secretary-treasurer will usually be the only new member each year.
6. Each member of the Council will be appointed to a subcommittee.
7. These By-Laws may be amended by majority vote of those members present at any regular meetings.
8. An executive council, comprised of the Chairman, Vice-Chairman, Secretary Treasurer and immediate Past Chairman, is empowered to carry on routine council business between regular meetings of the full King County Environmental Education Council.

A CHECK LIST OF IDEAS FOR AN ENVIRONMENTAL EDUCATION COMMITTEE
(Compiled for Teacher Comments)

Provide foundation for carrying out an environmental education program in an area.

Purpose of council

- a. Provide environmental training for educators and other interest groups (B.S.A. leaders, church groups).
- b. Selling group for environmental education.
- c. Guidance and advisory group.
- d. Locate technical assistance for carrying out an environmental education program.
- e. Contact point for state and regional groups in environmental education.

People on council

- a. Group structure
 - 1. Figureheads - provide influence and stature to the group (mayors, state reps.).
 - 2. Technical resource people (local, state, and federal resource agencies).
 - 3. Concerned people who don't have the knowledge of environmental education, but have driving force for action
 - 4. Key educators and administrators, principals, school boards, teachers.
- b. Make up by size of area
 - 1. Large towns - target group--focus on educators and board of education because of large number of people.
 - 2. Small towns--can cover all the towns, interests and types of people.

Jobs of council

- a. Set up a training team of resource and environmental educators.
- b. Establish workshops for educators and other interest groups.
- c. Set up environmental study areas.
- d. Guidance for school programs.
- e. Clearing house for assistance to educators (provide information on who to contact or directly supply the technical assistance).
- f. Inventory what other groups are doing in environmental education, and try to provide central direction.

ACTION PLANNING FOR ESTABLISHING A LOCAL ENVIRONMENTAL EDUCATION COMMITTEE

List the steps involved in setting up an environmental education committee in your local area.

Community (or area or regional)
Needs in EE.

How the EE Committee Could Meet That Need.

Identify key people and groups to be included in EE Committee.

**People and Groups to be
Included on EE Committee**

Reasons for Their Being Included

Projects the committee might do to help needs:

Short-term projects:

Long-term projects:

(Select 1-2 projects from the above list that the EE Committee could initiate and complete in one year.)

Project:

Steps to Implement the Project

Target Dates

—

—

—

—

SAMPLE CHART

Functions of the EE Committee

People or Groups Who Might Help EE Committee	Identify Local ESA for School Use	Teacher In-service	Provide Public Forum for Sharing EE Concerns	Disseminate Info on Local Current Envir. Problems	Assemble Current Material for School Library	Etc.
Park & Rec. Department		Site				
School Dist. Superintendent		Support				
Turned-On Teacher		Help Plan & Instruct				
News Media		Publicize				
Federal Agency		Provide Resource People &/ or site				
Local Planning Commission		Provide Maps, charts Info. on studies				
Civic Organization		Provide steak bbq				
Conservation Club						
Industry						

Construct a chart similar to the sample above. Put in your own column headings for:

- a. People or Groups Who Might Help EE Committee
- b. Functions of the EE Committee

This chart can be a planning tool for initiating and implementing various functions of the EE Committee.

ENVIRONMENTAL STUDY OR LEARNING AREA

The educational process must encompass a wide variety of learning environments in order to equip our young people with the educational tools necessary for intelligent and effective environmental management.

There are many opportunities outside the classroom that provide students with a variety of environmentally oriented experiences.

Teachers and administrators must be able to identify and use these "outside-the-classroom" environments to complement the existing school curriculum.

One term applied to these learning environments is Environmental Study Areas (ESA). These areas can be used for the application of basic learning skills through collecting and interpreting data, identifying environmental problems, exploring cause-and-effect relationships, and developing alternative solutions to environmental management.

An Environmental Study Area is a place then, where a person can become involved in investigating some aspect of man's relationship to his environment (natural or man-made). It can range from a near natural area to the man-altered areas of urban renewal.

Steps to initiate an Environmental Study Area Project in your school district might include:

Inventory the Environmental Areas of the community (natural, man-made, man-altered, etc.)

Inventory professional and avocations that can make a contribution to improving the interaction between students and their community environment.

Develop a broad curriculum spectrum to visually show how the school site, local ESA, profession, avocations, etc. fit into the education objectives.

Hold a series of environmental-awareness workshops and meetings for the public, teachers, students, etc., to unveil and discuss the proposed total community environmental education project.

Establish a series of lay committees (students, teachers, community people) to develop learning packages to fit the environment, needs of kids, teachers, and educational objectives.

Parts of the project include in-service training courses for teachers to develop additional skills in the use of ESA's (such as setting up problem solving situations, data collecting experiences, etc.).

SCHOOLYARD DEVELOPMENT

The school can be used to apply skills learned in the classroom as well as develop a concept or understanding about some relationship that exists in the eco-system.

Here are some items to consider in the development of schoolyard ESA-- Establish a school site committee (students, teacher, and community; Ext. -- SCS, etc., parents.

Construct a map of the school site.

Identify and describe unique characteristics.

Develop a plan of use and alternative use.

Develop a brochure about the school lab.

List plants and plot on map.

Investigate possible sources of plants.

Develop a priority planting plan.

Plant first round of plants.

Establish records and keep procedures.

One-day in-service workshop on use of schoolyard as a learning environment.

(Involve students, teachers, parents.)

Write-up schoolyard environmental investigations (involve students).

Water and maintain plants--summertime.

Plant second round of plants.

Second in-service workshop.

continue: 1. Development of schoolyard.

2. Training sessions (students-teachers).

3. Curriculum development.

Each teacher can involve her class in the inventory of their schoolyard and itemize how they can use it in their teaching situation.

Here are some examples of items to be considered for development for use by students, teachers, PTA, community, etc.

1. Arboretum of Plants

- a. Description: An area planted to native plants, trees, shrubs, ground cover plants, ferns, mosses, fungus, lichens. This is a long-term project. The sunloving plants are planted first and as ground shade is produced, shade-loving plants such as ferns, etc., can be added.
- b. Possible learning situations: Classifications, identification, economics of plants, growth requirements, develop observational skills, art texture, aesthetics of plants, seasonal changes of plants and animals, studies in plant succession.
- c. Location: Corner of schoolyard, area not in mainstream of play yard.

2. Soils Pit

- a. Description: A soil pit or bank large enough for several students to get into and conduct studies of soil horizon depth, texture, structure, pH, root penetration. There should be such a pit for each different type of soil in the area. Should be fenced so students can't fall in; consider a roof on the pit for winter use.
- b. Possible learning situation: Soil studies related to plant growth requirements, water percolation, what is soil, land capability, soil erosion, hazard studies, process of soil making, art of painting texture.

c. Location: Corner of school yard or nearby vacant lot, etc., where good soil profile can be studied safely.

3. Wildlife Habitats

- a. Description: Areas along the fence rows, odd corner and even some landscape areas around buildings to be planted to multiflora rose, bitter cherry, mountain ash, india plum, cascara, etc. Will provide aesthetic screening from neighboring houses, protection for birds, and color to the school yard.
- b. Possible Learning Situation: Classification, identification of wildlife, wildlife habitat, comparing to other, requirements for survival, wildlife found in area, social and economic values of wildlife, an area of social structure with species of wildlife, physical adaptation of wildlife to this environment (do all kinds have same type of bill? Why don't squirrels have canine teeth, etc.?)
- c. Location: Along fence row, odd corners in school yard, flower beds, etc.

4. Outdoor Classroom Gathering Place

- a. Description: For class to gather informally to study anything. A secluded spot, sheltered from wind and people. Might be a depression in the ground, an amphitheater type. Might have benches, logs, or just grass.
- b. Possible learning situation: The class does not have to stay in the four walls of a classroom to study from a text, do a language arts assignment or have a debate. Can be used to enhance writing a Haiku, read a poem, discuss a current problem or do a class assignment.

5. Picnic Area

- a. Description: Area under shade trees on or near lawn, or mowed grass area with enough tables so a whole class can enjoy a lunch. Fireplaces can be provided as needed or desired.
- b. Possible Learning Situation: Develop proper attitude for use of outdoor environment -- what to do with garbage, papers, etc., after eating, how to properly build and extinguish campfire and cleanup afterward, social experience of courtesy and sharing the outdoors together, values of recreation facilities, need for proper use of outdoor with more leisure time.

Outdoor Environment Laboratory Area

- a. Description: (1) An area of land that is in its natural state. This might be a wooded area, a vacant lot of native grass, and other plants, hardwood area, a bog, swamp, etc. The important thing is that it remains in its native state and that man doesn't

tamper with the natural environment. This may be an area $\frac{1}{2}$ to 20 acres or more. (2) An area near the school buildings for students to plant a garden of tree seedlings, flowers, or vegetables in conducting growing plant studies.

- b. Possible Learning Situation: Quadrant study of soil, plants, wildlife relationships, studies in plant succession, natural and social history studies of area, wildlife habitat, growth requirements of plants, aesthetics of natural areas.

7. Landscaping of School Grounds

- a. Description: Should be accomplished as a part of the overall learning environment plan for entire school property at time school is built. Many native and introduced plants lend themselves to low maintenance costs and maximum aesthetic educational values. Sycamore or sweet gum trees, for example, are fine to plant in front of south and west school room windows to provide shade for bright sunny days thereby cutting glare and heat inside and causing better learning situation.

Provides aesthetic appearance, benefit and credit to community. Beautifies the school grounds and blends buildings to fit the school yard. To reduce classroom glare and solar heat problem, thereby increasing effectiveness of classroom learning environment.

- b. Possible Learning Situation: Aesthetics and beauty of our school environment, classification and study of new plants, difference and reason for soil temperature in culturalized flower beds and compacted turf areas. Difference in ornamental plants from native plants. Difference in wildlife found here from other areas. Shade as a factor in temperature change.
- c. Location: Entire school grounds.

NATURE TRAILS WITH SELF-GUIDED BOOKLET

Nature trails are developed in areas that have some natural resource features that can be interpreted and discussed with students. These are outdoor museums where the student observes, makes inferences about what he sees, and then can discuss it with his class. The tour booklet helps the teacher prepare for the experience by giving her background information and by listing some questions that she can use as an interest starter for the lesson. The Audubon Society, Park Service, and U.S. Forest Service have several publications available as references in the development of nature trails.

SAMPLE INVENTORY SHEET TO USE WITH YOUR CLASS
IN INVENTORYING YOUR SCHOOL YARD

Part 1. List the different areas on your schoolyard that can lend themselves in providing meaningful learning activities for your students. You can list your areas by location, different plant communities, habitats, etc.

<u>Area</u>	<u>Activities</u>
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Part 2. List the specific things you would add to your schoolyard to improve its use as an outdoor classroom (plant wildlife, food plants, develop arboretum, etc.)

<u>Area</u>	<u>Activities</u>
-------------	-------------------

Part 3. Make a sketch or drawing of your schoolyard showing the location of items in No. 1 and where you would put items listed in No. 2.

(Develop land use zoning and planning guidelines for schoolyard and delineate uses on schoolyard sketch map.)

SAMPLE WORKSHEET FOR INTERPRETATIVE STUDY AREA

Area or
Station No.

Description of area or
Station

Interpretation of Area or Station

SAMPLE WRITE UP FOR AN INTERPRETIVE STOP

Grade level to be used: _____

Description of object: (Rotten log, crowded tree stand, evidence of wildlife, soil pit, etc.)

Interpretation of object: (Discuss the ecological and natural aspects of the subject)

Discussion of subject with students through questions (List questions and investigation in sequence for developing the subject with students)

List areas of curriculum where this activity would apply and give an example.

SAMPLE FORMAT FOR AN E.S.A. PLAN

(Suggested Portland Public School Environmental Study Areas)

Some of the major environmental learning environment has been identified on the enclosed map and a short resume of each follows.

Forest Park. Owned by Portland Park Bureau is located in the west hills of Portland. This 5,000 acre forest is located on typical steep forest land accessible by road and trail. Studies of this forest environment can include: geology, forest soil formation, plant succession, economic and historical significance to Portland, political implications in making it a Forest Park, pollution problem of an urban forest, soil-plant-water relationship, social impact on recreation and leisure time users.

Present educational use includes primary grades observing seasonal changes to sophisticated high school and college experiments in plant succession.

Oaks Bottom, Urban Wetlands. Owned by Portland Park Bureau, as an undeveloped park, it is located at the northeast end of Sellwood Bridge. It is approximately 100 acres in size and is the only wetland area left inside the city suitable for urban wetland ecology studies. All others have been claimed for industrial or developed recreational use which has destroyed all of the wetland characteristics and limited the waterfowl nesting sites. It has the largest population of nesting waterfowl of any area in the city. Studies can include ornithology observation and record keeping, bird banding, records of nesting habits of migrating fowl, study of migratory flyways, international treaties, political action on hunting regulations, bog and wetland plant succession, water hydrology studies, stream overflow and siltation, long term bird blind photography projects and record keeping.

Present educational use includes bird census for scientific reporting journals by high school and college students to waterfowl observation by elementary students.

Johnson Creek Study Area. Owned by the city, this one study area is located at S.E. 39th and Johnson Creek. This is a typical small urban stream that has been polluted by housing and light industry development. Studies can include collecting and interpreting data on water quality, observing, collecting and classifying aquatic life and predicting pollution levels and causes, economics and political action to alleviate that pollution, studies in adequate land use planning and zoning, on going experiments and data collecting of changes in the creek.

Present educational uses include determining stream flow volume by intermediate students to measurement of O_2 and temperature levels by high school students.

Mt. Tabor Park. Owned by the city; it is an extinct volcano developed as a park. It includes a picnic area, amphitheater (in the mouth of the volcano), water reservoirs, horticulture garden, some semi-natural forest areas and commands a sweeping view of Portland. Studies can include: geology (physical and historical), geography (map reading skills including economic and land use patterns of growth), forest and horticultural plants, comparisons of natural and man-developed recreation areas, water reservoirs, water works, watershed etc.

Present educational uses include: map reading, skills by intermediate students to earth science studies in volcano geology by high school students.

Rocky Butte. Owned in part by Multnomah County, it is located on city limits between Portland and Parkrose. It has much the same uses as envisioned at Mt. Tabor. It commands a good view of the Portland Airport, Columbia River and Cascade Mountain range. Studies can include map reading skills, geology of landscape, economic importance of proposed housing development on Rocky Butte, Portland Airport (as an industry, service, and taking agricultural land out of production) rock quarry, deciduous forest environment.

Present educational uses include nature hikes.

Columbia School Farm. Owned by the school district, this land is already being utilized by the schools to involve urban students in important experiences of managing farm land and producing valuable crops. Studies include: horticulture techniques, responsibility for growing and harvesting crops, home economics in preparing and canning food, agricultural and home and business economics, machinery repair, marketing experience, soil-plant relationships, land capability, experiments in flood plains, land values, etc.

Present educational uses encompass much of the above.

Whitaker School - Fresh Water Lakes. Owned partly by the school district and private land owner, this fresh water lake area is the last of its kind in the Portland area. Developed naturally in the flood plain of the Columbia River, these lakes are fed from fresh water springs. There are 40-50 acres of private land surrounding the lake that should be purchased immediately to insure protection from industrial pollution and to allow for a maximum of educational development of the area.

Studies can include comparison of fresh water aquatic life to slough aquatic life and relationship to water quality criteria, ecological comparisons to Johnson Creek, Willamette River and mountain stream in Forest Park, ecological stages in the development and death of a lake, census studies of mammals and birds around the lakes, comparisons of animals with other environmental areas, (Why do you find different waterfowl at Whitaker than at Oaks Bottom, for example?), studies and experiments in reestablishing different animal habitats in and around lakes to bring back a variety of animal life, land use planning and zoning, land development, for proper utilization such as an arboretum, natural plant succession area.

Present educational studies include: collecting data on wood duck nesting sites (only a small number of wood ducks in area) by elementary students to collecting zoo-plankton from bottom by high school students.

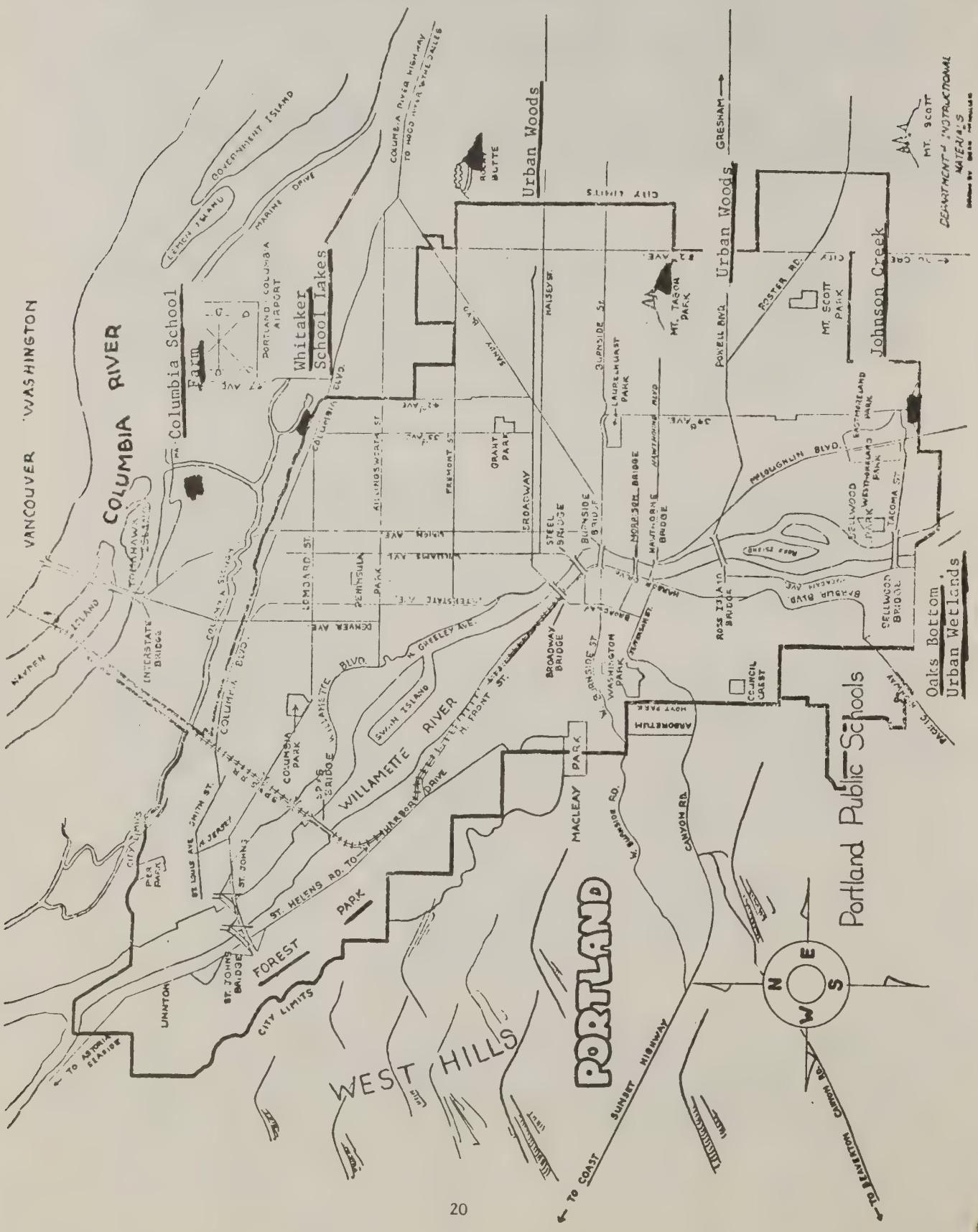
Other Environmental Study Areas (not marked on map)

There are a variety of other environmental study areas and sites available to further enhance the educational process. School yards can be used for experiments in black-top and lawn ecology (those schools privileged to have a grove of trees or wooded area on or near the schoolyard can engage in types of urban wood ecology studies). Vacant lots, city parks, students' backyards,

urban renewal projects, study of old and new architecture, city transportation flow patterns and changes, zoo, O.M.S.I., Western Forestry Center, Rose test gardens, Hoyt arboretum, all must be more fully utilized to involve students in a variety of realistic educational experiences so that they will relate intelligently and positively to their total environment.

As these and other areas are identified as potential environmental study areas, suggested curriculum guidelines, activities and teacher in-service training programs for their use must be developed and scheduled to insure proper and intelligent use.

MAP OF PORTLAND SCHOOL ENVIRONMENTAL STUDY AREAS



A CHECK LIST OF IDEAS FOR ENVIRONMENTAL STUDY AREAS
(Compiled from Teacher Comments)

Identify need for Environmental Study Areas.

Environmental Education Council should include a committee (team) for E.S.A. to identify, select, inventory, each site and determine guidelines for its use and management.

Goals

Determining individual commitments by members of our committee and our group-- establish a committee.

Involve total community--missing as few people as possible.

Education formally will be a sub-action of the community committee.

Get action to replace words--a timetable.

Identify individuals interested--agencies and committees already involved established committee.

Involve resource people, civic organizations, informal and formal groups, interested groups, clubs.

School--representative appointed by Superintendent.

Meet--for action.

Encourage active participation and community leadership.

Develop criteria for priorities of land selection.

What ecosystems do we want to study?

Look for an area or areas that represents several ecosystems and environmental situations.

Comparisons natural vs. man-made.

Inventory Jobs

<u>Who</u>	<u>Reports or record</u>
Divide the job of inventory	a. Map
a. Natural areas	b. Photogrammetry
b. Urban	c. Photos
c. Rural	d. List of what is on area (narrative)
How - field investigation	e. Distance from school

Selection

Prepare a plan of development and show to best use the selected areas.

Which of the inventoried will we use and promote?

Prepare a summary of areas with our recommendation.

Availability of land.

Development

Secure approval for (ownership?) use from appropriate agencies and individuals.

Inventory existing physical features.

Determine desirable additions--development priorities, including: Timeline and master plan, safety, access to and through et al.

Implement and coordinate: a. Work forces, b. Finances, c. Public relations, community involvement.

Develop in-service program for interested teachers, etc. (require it before use of E.S.A.'s)

Promotion of area

Meet with local press, community leader and groups.

Initiator--stir interest--locate other interested parties.

Gather interested people for local site committees.

Set some objectives based on local needs. Committee would develop selling approach to proper officials.

a. Promote inventory of potential sites

b. Promote use of sites

ACTION PLANNING FOR ESTABLISHING AN ENVIRONMENTAL STUDY AREA PLAN

1. What function does an Environmental Study Area serve?
 2. a. List the possible steps that might be involved in initiating an Environmental Study Area project in your area:
b. Number the steps in the sequence they might be done.
 3. Name the people or groups who might help in the inventory and use of Environmental Study Areas:
 4. Develop a matrix showing jobs to be done and people to do them. Use information from #2 and #3 above.

People or groups who might help in inventory and use of ESA from #3 above.

Steps and target dates in initiating an ESA project, from #2 above.

TEACHER TRAINING

One objective of conducting teacher workshops is to improve teacher education by giving the teacher the tools to become highly skilled in involving students in the total learning environment. The application of these tools will develop interactions between a student and his environment that can lead to the development of his responsibility toward his society and environment.

One of the most productive approaches to teacher training is one that utilizes the process approach to learning and assists teachers in developing an activity oriented curriculum.

This approach is based on a philosophy of direct involvement and participation. The investigations require people to collect and record observable information about a particular environment. The interpretation of data throughout the sessions generates a high level of interaction and discussion about the implications to environmental management. (See the Lesson Plans in the Investigating your Environment Series for examples of these processes).

SAMPLES OF ENVIRONMENTAL EDUCATION WORKSHOPS

A Two-weekend Workshop Format (3 college credits)

Objectives:

As a result of this course, teachers should be able to:

1. Involve their students in environmental investigations using techniques of:
 - a. Collecting, recording, interpreting and analyzing data about
 - b. Formulating alternative solutions and action plans for environmental problems.
2. Identify areas on the schoolyard and other parts of the community that could be used as environmental study areas and develop materials for their use.
3. Develop instructional materials that strengthen the relationship of existing education programs to environmental education.
4. Explain to key community leaders and group how environmental education helps accomplish the goals of quality education.

Friday

7:00 - 10:00 p.m.

- Registration, orientation, philosophy, process, approach, classification and observation activities.

Saturday

(Teachers will be in three groups and rotate)
Environmental Field Investigations

8-12:00 a.m.

- Investigations for Land Use Planning, Measuring Some Water Quality

1-5:00 p.m.

- Criteria, Interpreting the Landscape

7-9:00 p.m.

- A Land Use Simulation Game

- Sunday
8-12:00 a.m. - Investigations for Land Use Planning, Measuring some Water Quality
1-3:00 p.m. - Criteria, Interpreting the Landscape.
- Friday
7-10:00 p.m. - Planning for the Urban Investigation
- Saturday
8-3:00 p.m. - Urban Investigations
3-5:00 p.m. - Comparing two Environments
7-10:00 p.m. - Planning and development for selected environmental education programs (E.S.A's outdoor school, simulation)
- Sunday
8-12:00 a.m. - Teachers will be divided into three groups and will select one topical area for the day: Observing Environmental Habitats, Mapping the Environment, and Creative Communications
1-2:00 p.m. - Environmental Education and the Total Learning Environment

SEVEN-EVENINGS AND TWO-SATURDAY WORKSHOP FORMAT

- Wednesday
7:00 - 10:00 p.m. - Registration, Problem Solving Process, classification and observation activities
- Wednesday
7:00 - 10:00 p.m. - Land Use Simulation Game
- Wednesday
7:00 - 10:00 p.m. - Preparation for Urban Investigation
- Saturday
8:00 - 3:00 p.m. - Urban Investigation
- Wednesday
7:00 - 10:00 p.m. - Development of Environmental Study Areas, Environmental Investigation for Primary, Secondary, etc.
- Saturday
8:00 - 3:00 p.m. - Investigations of a Wetland Environment at Ridgefield Refuge.
- Wednesday
7:00 - 10:00 p.m. - Micro-Environmental Investigations
- Wednesday
7:00 - 10:00 p.m. - Comparison of Urban and Forest Environment
- Wednesday
7:00 - 10:00 p.m. - Curriculum Development in Environmental Investigations

A ONE-DAY "OUTDOOR LABORATORY" WORKSHOP FORMATS

(Use the Lesson Plans in Investigating Your Environment Series for Field Investigation)

- 9:00 a.m. - Arrive at area and assemble for orientation to field study. Gather into groups of about 20 each.
- 9:30 a.m. - Group Study Areas (Study areas would differ to fit the environment.)
- | <u>TIME</u> | <u>I</u> | <u>II</u> | <u>III</u> |
|------------------|------------|-----------|------------|
| 9:30-11:00 a.m. | Soils | Plants | Wildlife |
| 11:00-12:30 p.m. | Wildlife | Soils | Plants |
| 12:30-1:30 p.m. | Lunch | | |
| 1:30-3:00 p.m. | Plants | Wildlife | Soils |
| 3:00-4:00 p.m. | Evaluation | | |
- 4:00 p.m. 1. Form discussion groups by grade level: 1-3, 4-6, 7-8, and 9-12. A discussion leader and recorder will be assigned in each group.
2. Brainstorm the topic "How can we integrate the use and study of this outdoor laboratory into our present classes?" Dismissed.

1 Day Workshop

- 8:00 - Process Approach (6 Bits)
9:00 - Field Investigations (Investigating Your Environment Series)
10:00 - Coffee
11:00 - Field Investigations
12:30 - Lunch
1:00 - Task Card Development
2:30 - Go over rationale of lesson plans
- Evaluation
- Commitment -- "What I will do in the next six months."
- Pass out materials
3:00 - Adjourn

1 Day Workshop

- 9:00 - Process Approach (6 Bits)
10:00 - Field Investigations
11:30 - Lunch
12:00 - Leaf Classification
1:30 - Field Investigations
3:00 - Sharing Time (coffee)
3:30 - Get into grade groups and adapt one activity to fit your teaching situation
- Evaluation
4:00 - Adjourn

SAMPLE OF ENVIRONMENTAL INVESTIGATION ASSIGNMENT FROM A TEACHER WORKSHOP
ON ENVIRONMENTAL EDUCATION

- A. Describe in writing a project to be used in your teaching situation to inventory, collect and interpret data about some part of the man-made environment in which you live.
1. List procedures in process terms. (See Lesson Plan for a Process Problem Solving Approach to Learning.)
 2. Do not use the same content used this weekend. (Soil pit, stream, forest, or plants.)
- B. Describe in writing the results of the investigation as done by your students.

Examples:

Correlation of observable weather conditions to air pollution index.
Correlation of man-made sounds to noise pollution.
Effect of signs and billboards on sight pollution.
Effect of architecture on aesthetics.
Impact of local shopping center on community.
Supermarket Survey (packaging, buying habits).
Interpreting the man-made landscape using architectural styles, etc.

SUGGESTED FORMAT FOR ENVIRONMENTAL EDUCATION - COURSE ANNOUNCEMENT

(Location and Date)

Dear Educator:

Environmental Education Course No. ____, 3 credits, will be held at _____, on the weekends of _____ and _____. Credit is being offered by _____ College.

The course utilizes the process approach to learning and assists teachers in developing an activity oriented curriculum using various parts of the environment as a classroom. It uses problem solving skills and environmental field investigations to develop concepts of environmental management.

Other sessions include planning for Environmental Education programs such as: developing and use of Environmental Study Areas, (schoolyards, parks, streams, urban areas, etc.), outdoor school planning, simulations, curriculum development, etc.

Costs involved: 3 credits
Board and Room

There will be optional materials and supplies for sale (about ____).

What to bring: Sleeping bag, rain hat and coat, sturdy boots (rubber boots if you have them), warm jacket and clothes, tooth brush, etc.

As a result of this course, teachers should be able to:

1. Involve their students in Environmental Investigations that develop ecological understandings through collecting, recording, and interpreting data.
2. Identify areas on the schoolyard and other parts of the community that could be used as environmental study areas.
3. Develop activities, teaching aids or other instructional materials to fit local environmental study areas.
4. Explain to key community leaders and groups how environmental education helps accomplish the goals of quality education.

Instructor

Schedule

Friday

7 PM

- Registration
- Process and Problem Solving Approach to Environmental Education

Saturday

8 - 12 PM

1 - 5 PM

7 - 10 PM

- Soil Investigation for Land Use Planning
- Measuring Some Water Quality Criteria
- Developing Your Own Environmental Investigation
Discussion Skills
Task Card Development

Sunday

8 - 11 AM

12 - 3 PM

- Forest Investigation
- Observing Environmental Habitats

Friday

7 PM

- Simulation Games -- Using hypothetical land management situations to develop skills in environmental problem solving.

Saturday

8 - 5 PM

7 PM

- Preparing and conducting an Urban Investigation (small groups)
- Finalize preparation of investigations to entire group

Sunday

8 - 12 AM

- Presentations of Environmental Investigations
- Comparisons of two environments
- Environmental Education and the Total Learning Environment
- Evaluation

Class Assignments

1. Develop and conduct with your students an investigation of some part of the man-made environment. Report, in writing, what you did and how you and your class planned and carried it out. Show examples of recording instruments, summaries, etc.
2. Develop some aspects of an environmental program that can be implemented in your teaching situation. (ROS, task cards, schoolyard development, etc.)

REGISTRATION FORM

Return this registration form before

DISTRICT _____

SCHOOL _____

NAME _____

HOME PHONE _____

HOME ADDRESS _____

ZIP _____

I will pay pro-rated tuition at registration. Board and room, cost of approximately _____ should be paid for at the time of registration.

A CHECK LIST OF IDEAS FOR E.E. TEACHER TRAINING
(Compiled from Teacher Comments)

Involve community segments to conduct workshops

One-day workshops on school yard

Coordinated effort with other in-service training

Formulate a training team of resource people and educators (minimum 4 people).

Informal contact with educators to gather input into a potential program.

Preliminary informal contact--principal to get a feeling for support and opposition to a program.

Board of Education contact

Individual preliminary contacts

General board meeting with superintendent present

Make initial teacher contact at District orientation session in the fall.

Meet with small groups of teachers for session (possibly during "observation days") staggered during fall to cover all teachers eventually. Not to exceed 10 people/group (principals invited).

Organization of schedule--based on time available. Probably 1-day. Do not overextend (probably 2 sessions, but enough to integrate), and adapt to local situations.

When to hold - before school begins, in-service days, weekends, etc.

Develop a schedule, format and program for setting up and conducting a one-day teacher workshop.

What to teach

Who teaches what. Select resource people and educators for instruction and train them before workshop.

ACTION PLANNING FOR A TEACHER WORKSHOP

1. What skills or competencies do teachers in your area need in Environmental Education? Example: Skills in setting up open-ended environmental investigations with students, skills in using Environmental Study Areas, discussion skills in environmental issues.

2. Based on skills and competencies identified, construct a schedule showing what sessions will be conducted.
Consider length of time,
number of participants,
who is available to construct,
who you need to contact.

ENVIRONMENTAL EDUCATION CURRICULUM

Objectives for an integrated curriculum include:

To improve the learning of basic skills (reading, writing, arithmetic) by providing experiences that allow for application of those skills in the total environment. Application of these skills in a problem-solving approach to the environment will give children the motivation and competency to develop personal and group responsibility toward their social and natural environment.

Providing environmental courses, workshops, and meetings that involve the public in activities can result in an increased understanding of the environment, man's relationship and responsibility to the environment, and a motivation to participate in environmental problem-solving, especially at the local level.

Providing opportunities in career development for students interested in environmental occupational training.

1. The environmental education curriculum must provide opportunities for actual learner involvement in the environment. Many approaches to learning can be used to help children interact with their environment. Environmental investigation by its very nature demands the use of the process approach (observing, etc.). As the learner uses processes in problem solving situations, he develops and expands environmental concepts.

Environmental education activities should be open-ended in nature, allowing the learner to collect and record data based on his own observations, and provide opportunities for individual interpretations of that data. These activities should be relevant to the learner in his world, and appropriate for the environment in which the activity takes place. This implies that no one set of activities should be considered sacred, but that environmental education activities should be developed to fit the competencies and backgrounds of many different students and teachers in many different localities and environments.

2. Environmental Education Programs should:

- a) Provide opportunities to actually involve the learner in his environment.
- b) Provide opportunities for open-ended environmental investigations and data-collecting.
- c) Provide opportunities for the learner to make his own interpretations about the data he collects.

Reference: Proposed Environmental Education Plan for State of Oregon.

- d) Develop in the learner an awareness of the need for individual responsibility to maintain or improve the management of their environment.
- e) Help the learner to develop the ability to accept responsibility to maintain or improve his environment for future use.
- f) Develop in the learner an awareness of problems associated with population, natural and human resources, and related environmental problems that exist in the community.
- g) Incorporate environmental resource materials into selected areas of the school curriculum at all levels of instruction.
- h) Develop a population which exhibits cognitive learnings and affective behaviors which support productive interaction between the learner and the immediate environment.
- i) Provide continual experiences starting in kindergarten or first grade and extending through all grade levels. These should expand the learner's understandings of ecological relationships as well as improve their competence to investigate the environment and to make assessments at the level of their maturity.
- j) Provide training opportunities for teachers to develop the ability to involve students in relevant and significant learning experiences that utilize the basic learning skills in items a to f in environmental encounters.

3. As outcomes of an effective program, the learner should be able to:

- a) Demonstrate his ability to collect, record, and interpret environmental data and from this identify and name trends of environmental management at his level of understanding.
- b) Exhibit behaviors which demonstrate a desire to maintain or improve a quality environment.
- c) Demonstrate an ability to contribute feasible solutions to identifiable environmental problems.
- d) Actively participate in discussions related to environmental problems including man's management role in enhancing or alleviating these problems.
- e) Demonstrate a personal commitment to intelligent management by exhibiting behavior, such as voting on the basis of known data and avoidance of littering and defacing property.

For ideas on developing a curriculum using processes, problem-solving activities, task cards, etc., see:

Developing Environmental Investigations

Lesson Plans for Investigating Your Environment Series

ACTION PLANNING FOR PUTTING THE COMPONENT PARTS OF THE PLAN TOGETHER

(Review the parts of the plan--E. E. Committee, E.S.A.'s, Workshops, curriculum, and list the steps, meetings, target dates, projects, etc., needed to implement the plan. Identify individuals and/or groups best qualified to implement various parts of plan.)

ENVIRONMENTAL EDUCATION ACTION PLAN TIME LINE

(Working with other people from your area, identify key steps and target dates for implementing appropriate parts of the plan)

<u>Activity or Project</u>	Time Slots - List Jobs to be Done			<u>Remarks</u> (assignments, follow-up, key contacts, etc.)
	First Year	Second Year	Third Year	
Environmental Education Council	6 months			
Teacher Workshops				
Environmental Learning Areas				
Other				(Lesson Plans, contacts, presentations, instructional materials, etc.)

GOAL STATEMENT

What is your goal statement for environmental education?
(write it here)

What are some factors that contribute to the implementation of your goal statement

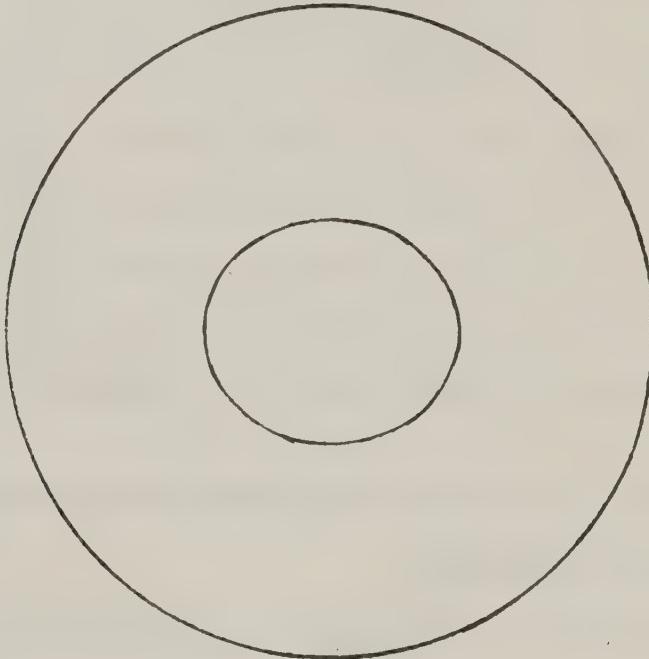
Factors that contribute positively--

1. _____
2. _____
3. _____

Factors that contribute negatively--

1. _____
2. _____
3. _____

1. The large circle is (your organization) (your school district).
2. In the small circle write your goal statement for environmental education.
(from page 1)



3. Draw a constellation of small circles around the center circle. Write in ea each circle factors (from page 1) that contribute to the implementation.

If it is a positive factor, do this -- \oplus

If it is a negative factor, do this -- \ominus

Distance of circles from the center will indicate how much the factors affect.

Place the factors that affect most closer to the center circle.

Place the factors that affect less farther from the center.

Your challenge is to maximize the positive factors and minimize the negative factors.

Positive factor

- 1.
- 2.
- 3.

How to Maximize

- 1.
- 2.
- 3.

Negative factor

- 1.
- 2.
- 3.

How to Minimize

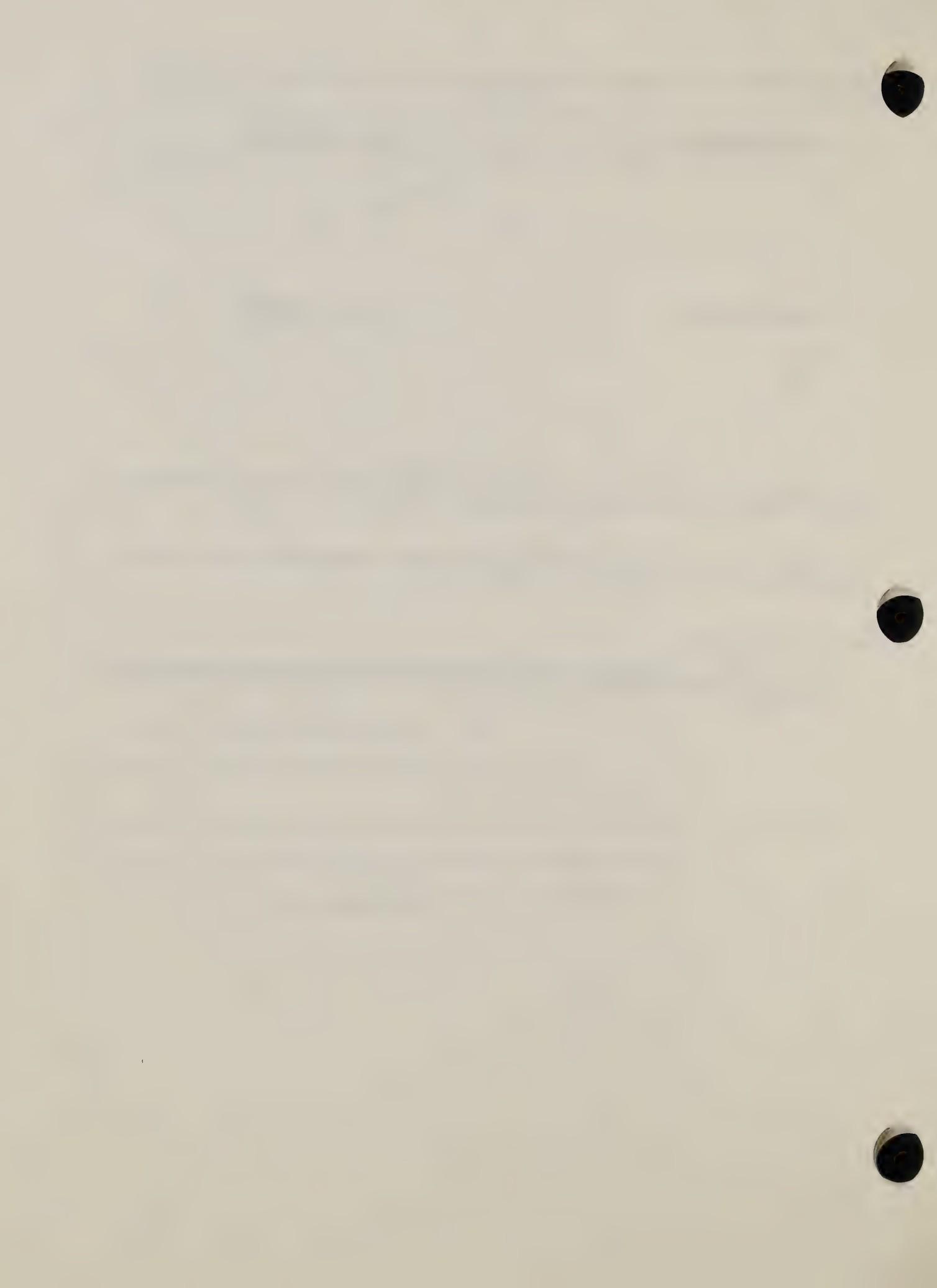
- 1.
- 2.
- 3.

The purpose of this exercise is to help you analyze your situation, and help you gain insights into factors that contribute to carrying out a goal.

Keep this -- Review it from time to time to reflect changes that occur in your perception of the situation.

Personal Commitment:

In the next six months, I shall do the following to strengthen Environmental Education:



DEVELOPING THE SENSE OF TOUCH

Select some common object for each person in the group to touch.

pencils, tables, coins--inside environment

leaves, rocks, sticks--outside environment

Blocking out the use of one sense.

Spend a few minutes exploring the object through the sense of touch, with eyes closed.

Ask for verbal descriptions of the object being examined.

What happens when we block out the use of one sense?

In the next 10-15 minutes, explore a designated environment through the sense of touch. (Occasionally you may wish to block out the use of one or more of the other senses.)

Write down several descriptions of the way certain things feel.

Meet back with the group. Share the descriptions you wrote.

What were some things you had never touched before?

What were some things that felt differently than you thought they would?

What were some things that felt like common household items?

What were some things you most liked to touch?

Select several phrases from the descriptions you wrote.

Put the phrases together any way you choose.

You now have a "string of impressions".



COLOR IMAGES

Introduction to the outdoor activity could begin by reading excepts from Hailstones and Halibut Bones* or simply by asking questions about color.

Green is the example given. Other colors may be substituted. Develop your own color images from the outdoor environment.

What are (green) things you can see?

What are the sounds of (green)?

How does (green) feel?

What are the tastes of (green)?

What things smell (green)?

(Green) is the feeling of

Reference:

PICKLES AND HUMBUG
A Bit of Comparative Logic

"The human race in its poverty has unquestionably one really effective weapon--laughter. Power, money, persuasion, supplication, persecution--these can lift at a colossal humbug, push it a little, weaken it a little century by century; but only laughter can blow it to rags and atoms at a blast. Against the assault of laughter, nothing can stand."

— Mark Twain, "The Mysterious Stranger"

PICKLES WILL KILL YOU! Every pickle you eat brings you nearer to death. Amazingly, the "thinking man" has failed to grasp the terrifying significance of the term "in a pickle." Although leading horticulturists have long known that Cucumis sativus possesses an indehiscent pepo, the pickle industry continues to expand.

Pickles are associated with all the major diseases of the body. Eating them breeds wars and communism. They can be related to most airline tragedies. Auto accidents are caused by pickles. There exists a positive relationship between crime waves and consumption of this fruit of the cucurbit family. For example . . .

- Nearly all sick people have eaten pickles. The effects are obviously cumulative.
- 99.9% of all people who die from cancer have eaten pickles.
- 100% of all soldiers have eaten pickles.
- 96.8% of all communist sympathizers have eaten pickles.
- 99.7% of the people involved in air and auto accidents ate pickles within 14 days preceding the accident.
- 93.1% of juvenile delinquents come from homes where pickles are served frequently.

Evidence points to the long-term effects of pickle eating:

- Of the people born in 1839 who later dined on pickles, there has been a 100% mortality.
- All pickle eaters born between 1849 and 1859 have wrinkled skin, have lost most of their teeth, have brittle bones and failing eyesight--if the ills of eating pickles have not already caused their death.
- Even more convincing is the report of a noted team of medical specialists: rats force-fed with 20 pounds of pickles per day for 30 days developed bulging abdomens. Their appetites for WHOLESALE FOOD were destroyed.

In spite of all the evidence, pickle growers and packers continue to spread their evil. More than 120,000 acres of fertile U.S. soil are devoted to growing pickles. One per capita consumption is nearly four pounds.

Eat orchid petal soup. Practically no one has as many problems from eating orchid petal soup as they do with eating pickles.

— Anonymous

WINNERS AND LOSERS

In any group of people there are winners and losers. This is certainly true in the teaching profession. Losers respond to situations with "if only" and "but." Losers spend their lives thinking about what they are going to do. They rarely enjoy what they're doing as they do it.

The "if only" and "but" comments of the losers in teaching sound like this:

If only I could buy more equipment.
If only I had smaller classes.
If only I had more time.
If only I had the support of my supervisor.
If only they'd fire Miss Zing.
If only I had an overhead projector.
If only I had gifted students, more chalk, fewer meetings,
no reports, a marriage--or a divorce--or a love affair...
If only we had a year to talk this over.
If only the people would just trust us.

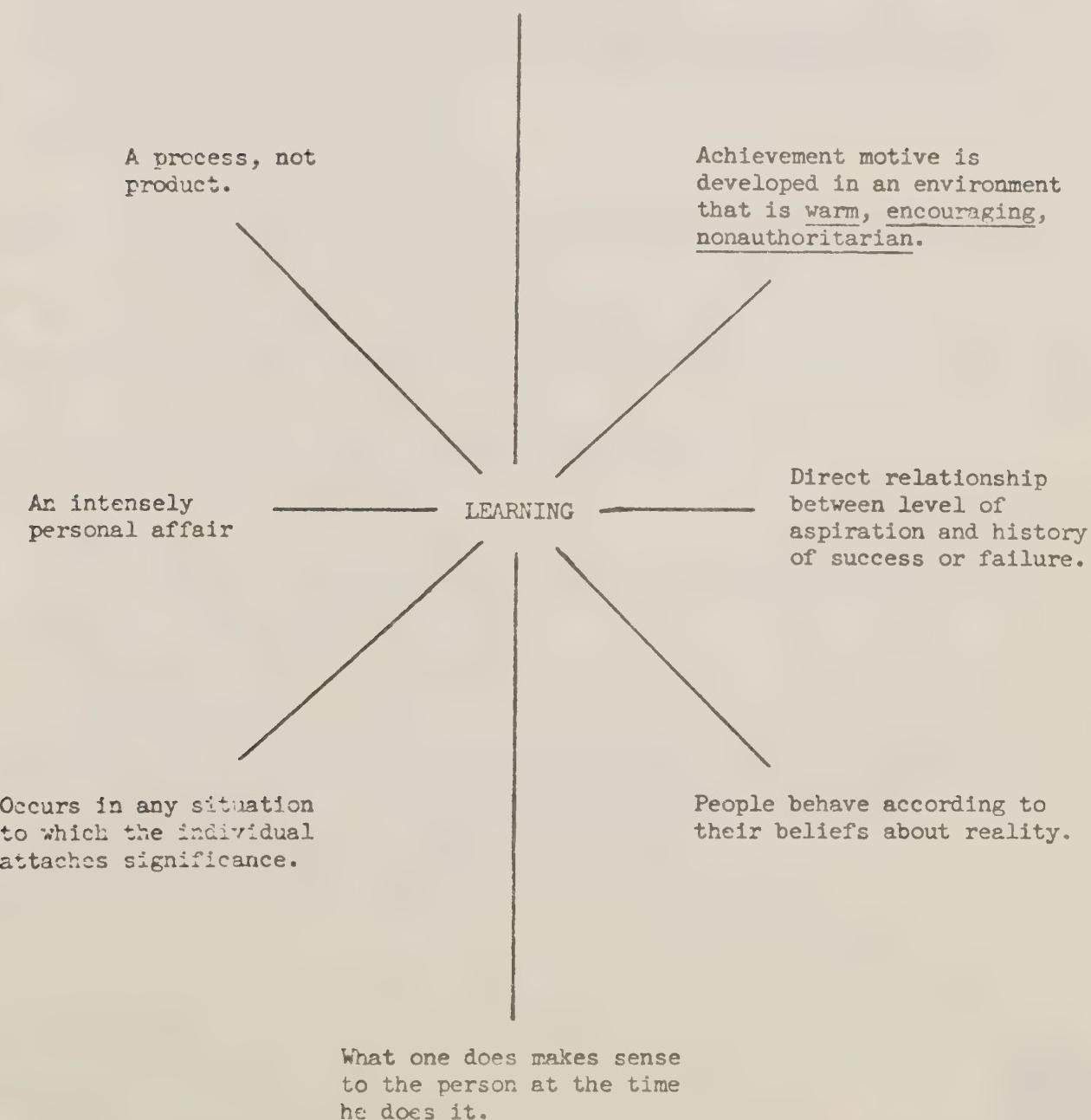
But they don't want to learn.
But the public doesn't want to get involved.
But they can't read.
But the principal won't let me.
But the superintendent is a bastard.
But parents don't care.
But I don't have time.
But that's too theoretical.
But sex is naughty.
But it hasn't been researched.

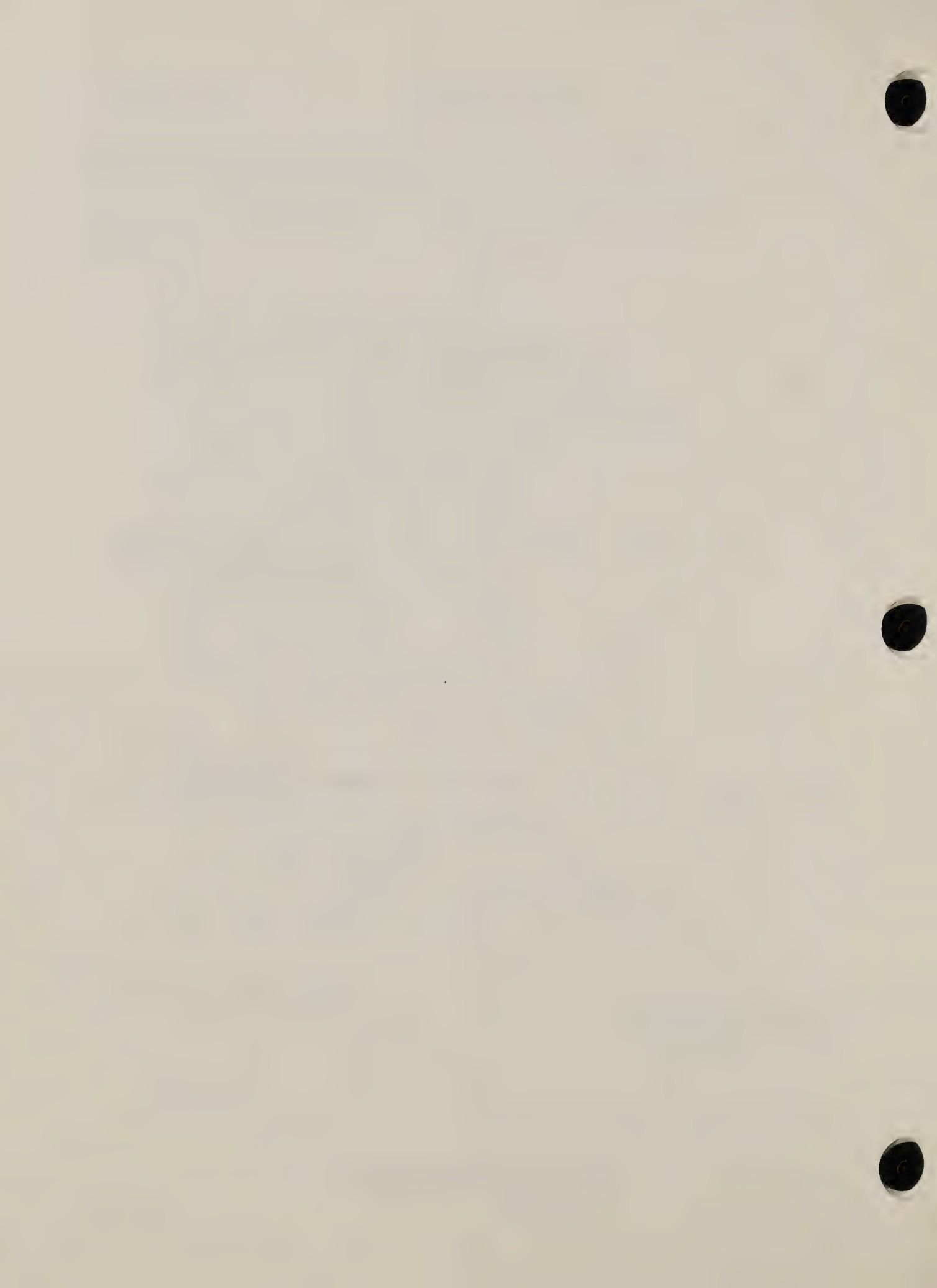
Winners say:

Let's go!
Why don't we try this!
I think we can do it!
Come on in and see what we're doing!
The group had a great idea!
I had a terrific weekend!
Maybe this will work!
Don't worry about our boss, we can bring him around.
That's beautiful!

HOW PEOPLE LEARN
(A Spectrum of Ideas)

To change a person we must begin with people and their perceptions--not with environment and opportunity.





SOME "AROUND THE SCHOOL YARD" ACTIVITIES

USING THE SENSES

Equipment Needed:

1 sheet of drawing paper ($8\frac{1}{2} \times 11"$) (manila) per child.
Each child brings one dark crayon (green, black, brown, etc.).
Each adult leader should have a clip-board and paper and pencil.
List as many of the children's comments as possible for each activity.

Tell the children you are writing down their descriptions.

At intervals throughout the activity, read back their comments to them.

At the end of each activity, read what was said as a summary.

Group leaders should give the comments and descriptions to the teachers at the end of the field trip for use back at school to make experience charts and story-writing.

"Sound" Hike - (10-15 minutes)

Group leader takes kids for walk.

Stop at intervals along the way. Have kids close eyes and listen for 30 seconds. At end of 30 seconds, kids describe a sound they heard.

(Group leader should write down the way each kid described his sound.)

Try to stop in different places so there will be a variety of sounds to be heard.

See how many different sounds your group can discover.

Ask: Which sound did you like best?

Why?

Does it remind you of something else?

Which sound is the loudest? The quietest? The highest? The lowest?

Mini-Forest - (Approximately 15 minutes)

(Investigating an Arm-Circle of Grass)

1. Lie on the ground, face down.
2. Make a circle by stretching your arms out in front of you on the ground.
3. Find at least five different plants inside that circle made with your arms.
4. See if you can find any tiny animals crawling through the grass.
5. What else do you see? (Any dead leaves or twigs?)
6. Spread the grass apart and describe what you see.

Big Idea - Many plants and animals live together in a community.



Sketching - (15-20 minutes)

Find 2 trees with different shapes. Observe and sketch one tree at a time.

1. Look at the tree from a distance.
2. With your finger, "trace" (in the air) the shape of the tree. (Do this from the ground up to top and from top down to ground.)
3. Describe the shape of the tree.
4. Make a "telescope" with your hands. Look through this "telescope" at your tree from a distance.
5. Describe how the branches go out from the trunk. (Up? Out? Down?)
6. Hold out your arms to show how the branches grow out from the tree trunk.
7. Go closer to the tree. What else do you notice about it?
8. Get close to the trunk of the tree. Look up into the tree. What do you see?
9. Go to a comfortable place where you can see your tree. Sketch it with the crayon you brought.
10. Repeat procedure for second tree.

Add some of nature's color to your sketch.

Pick some grass. Use it as a crayon. Rub it around on the paper to show where the green is on your tree.

Pick a yellow dandelion blossom. Use it as a crayon somewhere on your sketch.

"Touch and Feel" Hike - (Approximately 10-15 minutes)

Group leader takes kids for a walk. Gives following directions at intervals along the walk. (Add others when appropriate.)

1. Find the hairiest leaf around. Bring back a tiny bit of it. Compare with your other group members.
2. Find the softest leaf.
3. Find the smoothest rock.
4. Find the roughest twig.
5. Find something cool.
6. Find something warm.
7. Find something bumpy.
8. Find something dry.

"Color" Hike

1. Look for things that are different colors of green. Bring back 3 or 4 green things.

Arrange them in your hand according to lightest green to darkest green.

2. Find and describe things that are:
yellow-pink-brown-grey.

MATH MEASUREMENT

Determine length of step. Use this unit of measurement for:

Calculate perimeters and areas of schoolyard activity spaces (playfield, ball diamonds, open fields, etc.). Convert measurements to yards, meters.

Construct a conversion scale for metric measurements using the length of your step.

Find out how many times you need to run around the playfield to run a mile.

Find out how many acres are on your playfield.

Construct a map of the schoolyard using the plane table method.

Map to scale.

(Use Boy Scout Merit Badge Series on Surveying as a reference.)

Determine heights of trees, utility poles on or adjacent to schoolyards, using triangulation and a stick at least as long as your arm.

Compute cubic volume of trees and utility poles using above method.

Determine percentages of slope of land using a yardstick, another stick, a baby food jar half filled with water.

Construct a topographic model of your schoolyard using layers of cardboard.

Learn to use compass and determine cardinal directions on schoolyard. Orient map and compass to actual landscape from schoolyard.

Learn to use instant mapper and use it with the compass.

Observe and sketch geometric shapes seen on schoolyard or adjacent areas. (Find triangles, circles, rectangles, squares, lines, etc.)

THINGS TO DO WITH TREES

Observe and compare the shapes of trees.

How many shapes can you find?

Discuss the shapes. Is it triangular? Like a column? Evenly tapered?
Low and spreading? Regular? Irregular?

Find two trees with distinctly different shapes and sketch them.

Look for different shapes of trees on the horizon.

Observe and compare the branching of trees.

How many different directions do trees branch?

How do the branches grow out from the tree? Straight out? Out and then down? Out and then up at the ends?

Find two trees whose branches grow differently and sketch just the way the branches grow.

Write a comparison about the differences in branching of these trees.

Observe and compare the foliage of trees.

How many different textures of foliage do you observe?

Do the leaves grow up from the branches? Or do they grow down?

Do the leaves grow all along the branch, or only at the ends?

Do the leaves hide part of the branch?

Find two trees with different textures and sketch your impression of the textures.

Observe and compare the colors in trees.

How many different colors can you find in the trees?

Observe one tree at various times of a sunny day and compare the light patterns.

Observe, sketch, or photograph the designs and patterns made by the shadows of trees.

Observe and compare the bark of trees.

How many different textures can you find?

Make bark rubbings with newsprint and crayon.

How do trees enhance the environment of your schoolyard?

WEED PATCHES

1. Look for the different colors of the plants. Arrange the colors in a list--lightest to darkest:

2. Count and record the different kinds of plants that are below your knees:

- a. How many plants have few leaves? _____
- b. How many plants have many leaves? _____
- c. How many kinds of plants are stickery? _____
- d. Do any of the plants have flowers? _____

List the colors of the flowers:

e. Do any of the plants have seed pods? _____
Describe the different pods: _____

3. Now record the same data for the plants that are above your knees:

- a. Number of different kinds: _____
- b. Plants with many leaves? _____
- c. Plants with few leaves? _____
- d. Plants that are stickery? _____
- e. Do any of these plants have flowers? _____

List the colors of the flowers:

f. Do any of these plants have seed pods? _____
Describe the seed pods: _____

4. Are there any plants higher than your head? _____

Are there many, or just a few? _____

Describe these plants: _____

5. On a separate piece of paper, choose one of the following to do:

- a. Choose one weed and write a riddle about it, using four of the five senses to describe it.
Which of our five senses would you not use? _____
- b. Write a poem describing the weed, or a poem telling about the color "green."

- c. Write an imaginary story explaining how the tallest weed became so tall.

INTERPRETING CULTURAL HISTORY AROUND SCHOOL

Inventory building structures within a given distance from your school.

Develop a classification system for types of buildings. (Shape, roof shape, and type, materials in construction, etc.)

Develop a means of classification for age of buildings.

Map the vacant buildings within a given distance of your school.

Determine how long buildings have been vacant. (Observe deterioration, interview local residents, consult written records, etc.)

What function did the building perform when it was in use?

What factors caused the building to become vacant?

Who owns the building now? Is there another possible use for the building?

Make an inventory of fences within a given distance of your school.

What different types did you find?

What different materials have been used in the fences?

Develop a classification system for the fences you observed.

Develop a chart showing the type of fences and their most common uses.

If possible, find pieces of discarded fences and construct a board of these, listing uses for each.

Use aerial photo to locate section corners in your area. If possible, go to that location and look for a witness tree. See if scribing is identifiable.

Locate the watershed in which your school is located. What land uses are in that watershed?

Locate the source of your community's water supply. What changes have occurred in the water supply situation in your community?

Char McDonald and Zee Butler 5/70

CREATIVE COMMUNICATIONS IN THE OUTDOOR ENVIRONMENT

The following is a suggested list of activities that could be used in any environment. The activities are designed to help the student sharpen his observation skills and then communicate his perceptions and feelings about the environment to others.

I. ON THE WAY TO THE SPECIFIC AREA:

- A. Notice colors that are present.
- B. Give the colors descriptive names rather than common names (as if no one had ever determined color words).
- C. Stop along the trail and describe several colors as a group.

II. AT THE ACTIVITY SITE:

- A. What can you see around you? Discussion.
- B. What do you hear? Loudest noise? Smallest sound? etc.
- C. What phrases might we use to describe this area? (do a few orally).
 1. Jot down two or so phrases of your own.
 2. Get the group into a semi-circle and have each person read his phrases. Do this in quick order so that they will fit together and sound like one poem.
 3. Change the order of the group so that the phrases written make better sense. Have people form smaller groups and combine their phrases and then read them orally. (Do either of these activities)
- D. How can an area such as this dictate mood?
 1. What role does color play in creating this mood?
 2. How might our reaction be different if this area were black and white? Monochromatic?
 3. What are some advantages of color in our environment?
 4. How does color enhance or enrich our environment?
- E. Throw away (Scatter) art:
 1. Choose one pattern, shape, color, etc. you see and collect several pieces of forest litter that illustrate the pattern, etc. Arrange these pieces in your hand.
 2. Share with the group.
- F. Time alone
 1. Environmental interaction is a personal reaction to surroundings. You are to spend the next 45 minutes by yourself. You should select an area that is out of visual range from anyone else. You may sketch, write or just be alone. (Hand out any materials group members may need.)
 2. After 45 minutes regroup for a discussion:
 - a. Feelings?
 - b. Reactions?
 - c. Share any sketches, poems, etc. that individuals came up with.

III. GROUP PROJECT:

- A. How does nature communicate with us? (color? shape? location? season? light intensity? shadows? life or lack of it? etc.) Discussion.
- B. How might we communicate to others our impressions of, or reactions to, this environment (site)?



- C. What are some possible tools for communication? - sketch (natural media), poem (cinquain, Haiku, blank verse, etc.), collage, narrative (poem or prose), map of the area (student made), random thoughts, flat item mounting (forest litter) or maybe a sound recording with slides.
- D. For the next 40 to 60 minutes we are going to compile a booklet that will communicate to others our impressions of and reactions to this site. You may work as individuals or in small groups.

IV. FOLLOW-UP DISCUSSION:

- A. Examine the outcome of the project. If time allows each participant may want to explain his contribution. (This type of follow-up may not be necessary.) You may want to have every one look over and enjoy the booklet.
- B. If possible, a reproduction of the booklet should be made available to all group members.

Diane Brownfield, Milwaukie, Oregon
3/9/71

A FEW LANGUAGE AND ART ACTIVITIES IN THE OUTDOOR/ENVIRONMENT

DEVELOP A SENSE OF TOUCH

Spend a few minutes exploring a designated environment through the sense of touch.
Write down descriptions of the way things feel.
Share the description with the rest of the group.
Put some of the description phrases together to make a group poem.

DEVELOPING COLOR IMAGES

Introduction to this outdoor activity could begin by reading excepts from Hailstones and Halibut Bones, or simply by asking questions about color. Green is the example given. Other colors may be substituted. What are green things you can see? What are the sounds of green? How does green feel? What are the tastes of green? What things smell green? Green is the feeling of - - -

WALK TO OBSERVE FOREST INFLUENCES (factors that change the environment)

List the factors observed.

STUDY LOG (last winter's blow-down, a tree that split up the middle, insect damage on log nearby)

List all the things that have changed, and are changing the tree. (allow 10-15 minutes)
Order these factors the way you think they happened.

Count rings on the sections of the log cut up.

Why is there a difference in the number of rings on sections of the same log?

Spend 3-5 minutes writing down your thoughts on the above question.

Discuss your ideas.

STUDY SNAGS in the area that have evidence of forest influences. (snag with pileated woodpecker holes, burls, fungi, etc.)

Sketch these trees that show influences and write down ideas you have for possible language activities using these trees.

Sketch snag using natural material and writing cinquain.

Observe evidence of change on snag. Use campfire charcoal, (black), rotten wood (brown), elk lichens (green-yellow), bracken fern (green), iodine conk (red). Sketch on manila paper.

CINQUAIN

Write a cinquain about the snag.

1 word to name subject _____

2 words to describe it _____

3 words of action about it _____

4 word phrase about it (in this case, what this snag means to the rest of the environment) _____

1 word that sums up the subject _____

IMAGES AND HAIKU

Sit on end of dock or other NEAT place.

Write one image or impression for each of the senses.

(imagery or impression is very loosely defined as a "word picture")

words which bring to mind a brief impression of a scene.)

seeing --- ripples shifting their position around the lake.

hearing --- wind rising and falling through the trees, getting louder and closer and then fading away.

smelling --- the smell of pungent pines.

--- etc., etc.

Explain technical specification for HAIKU -- three lines of

5 syllables

7 syllables

5 syllables

Totaling 17 syllables which give a brief impression of some aspect of nature.
From these images, construct a HAIKU:

"Ripples make their way across
the lake as the wind
whistles through the pines."

OR

Describe the next six sounds you hear ---

Which are man-made sounds?

Which are natural sounds?

Which sounds were most pleasing to you?

Did your reaction to the sounds reflect past associations with those sounds?

Write a HAIKU about the sounds and their effect on you.

COMMUNICATION THROUGH CONVERSATION

According to Mother West Wind, animals conversed quite freely with each other. Do animals really communicate? How? Do birds communicate with mammals? Why? Using study skills, create a situation in the out-doors whereby animals might be conversing. Or, perhaps you might come face to face with an animal while on a hike. What would your conversation with that animal be like? Study Skills: punctuation, quotations, capitalization.

IMPLES

Study the materials on the forest floor. Discuss the implications of the effect of these materials on the forest. Differentiate between natural forest litter and man-made litter. Activity: Review the five senses. Choose an object from the forest floor. Using the five senses, write a riddle describing this object. It may be rhyme or prose. Example: This object is about the size of a small child's fist. It feels something like a scouring sponge, but it smells better than that. It smells like warm straw, and crackles when I squeeze it by my ear. It's sort of yellowish-green. I didn't want to taste it.

EVIDENCE OF WILDLIFE

Walk to pile of cut-up Douglas fir cones.

Why are these here?

Construct a story on evidence found:

What was the squirrel after? Where are the seeds in a cone? How many seeds per bract? How many seeds per Douglas fir cone? (Count several and take average)

Why are there so many cone pieces in one place rather than scattered around?

Follow up any or all of above topics in a written activity.

Use cut-up cone parts in a design to be pasted on 8x10 cardboard. Use as many parts of the cone as possible.

MINI-MURAL OF FOREST INFLUENCES

Collect influences (dried materials only--cones, twigs, bark, lichen, soil, etc.) Glue on 5x7 cardboard in a pleasing arrangement.

CARTOON AND LIMERICK (OR CAPTION)

Glue on piece of Ponderosa pine bark on a 5x7 cardboard.

Using only a felt pen, sketch in details of a cartoon, using the piece of bark as part of the scene.

Write a limerick to accompany the picture. (Can write a caption for the cartoon instead)

PONDEROSA PINE BARK THING

Collage, Mosaic, Design or whatever)

Collect pieces of bark and arrange them, glue on board.

by Charline McDonald, Phyllis Enger, Zee Butler

BLACKTOP ECOLOGY

ACTIVITY SUGGESTIONS:

Effects on temperature:

Place thermometers at various points at comparative and varying elevations around the blacktop to determine how the blacktop affects temperature.

Wind Drift: Place wind direction indicator (home made).

Wind Velocity: Place wind velocity measurer (home made).

Wildlife: Homes of insects, who lives here, placement of food to discover, types to be attracted, observe what animals visit our blacktop -- what evidences do we find, scat, feathers, etc.

Measurement: Pacing exercises - determine pace on blacktop.
Determine area of blacktop.
Redimapper activity to locate corners of blacktop.
Compass work to determine direction.

Soil: What is blacktop? Composition. Any evidences of this returning to soil? Compare possible advantages and disadvantages of blacktop. Comparisons of older and newer blacktopped areas. How does blacktopping weather? Compare with large concrete area.

Plant Life: Any evidences of plant life? When to best look for this? How to enhance this? Scatter some grass seed undetected. Have children observe daily in spring for two weeks. Types of plants, root systems.

Qualities of Blacktop: Describe the texture, porosity, hardness, etc. Utilization of excavations near the school site. Soil profile. Signs of early civilization.

Vocabulary: Synonyms for blacktop.

Products and jobs related to the manufacture and installation of blacktop:
Source of materials for blacktop.

Sundial.

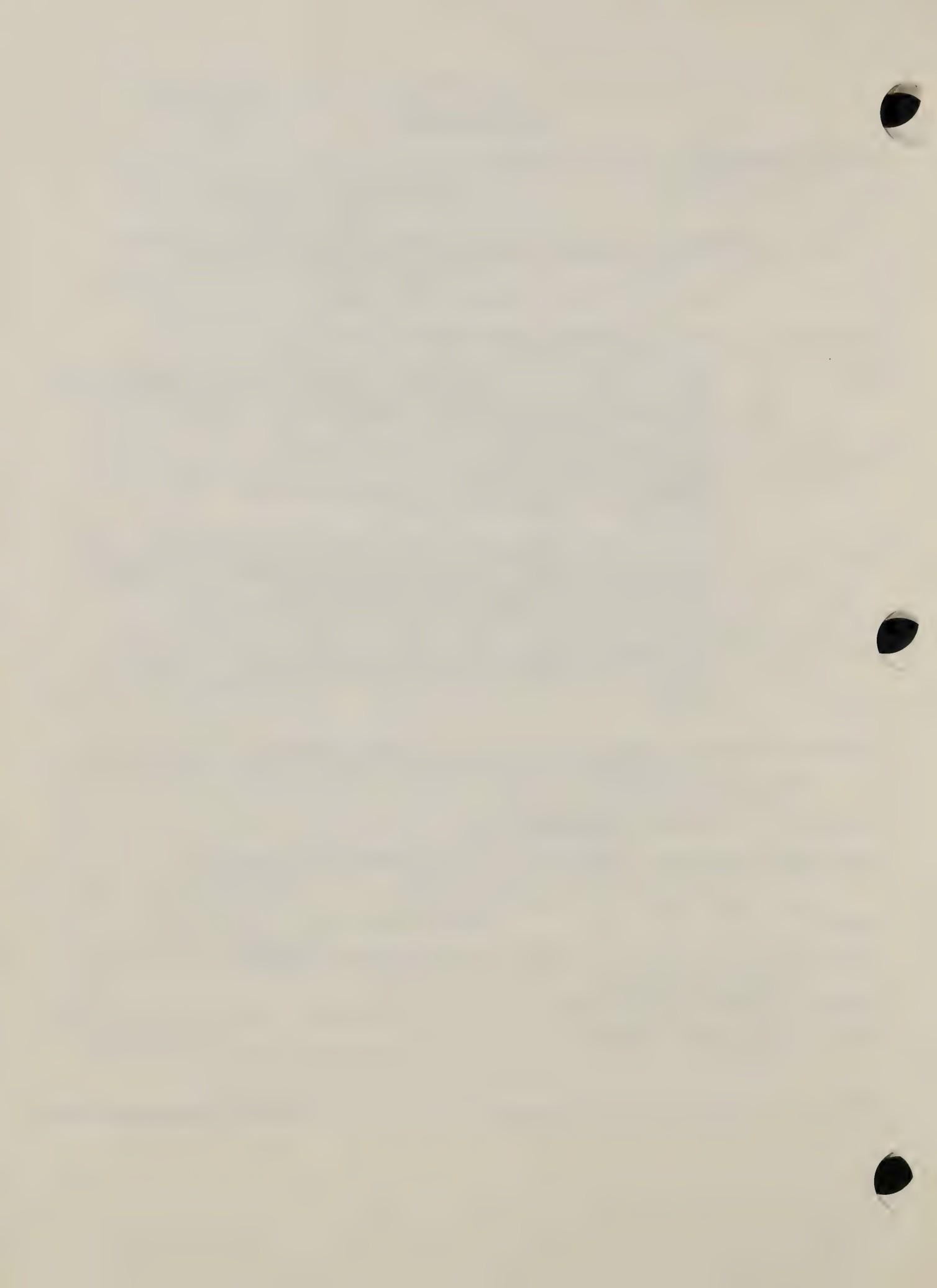
Creative Writing Topics: The life of an ant in the blacktop jungle.

Sounds of the blacktop environment.

Smells of the blacktop environment.

10/69

Don Cannard
Vancouver, Washington Schools



ENVIRONMENTAL HABITATS

Task A (30 minutes) Work in small groups.

1. Explore as many places (environments or habitats) as you can from _____ to _____, and record animals that you see or any evidence of animals. As you inventory the animals or their evidences, figure out some way of recording amounts of evidences and animals seen.
2. Look for and list evidence (signs) of animals (partly consumed foods, excrement, homes, bird nests, feather, etc.)
3. Observe and list different habitats for wildlife in area. (Grass, cultivated field, hedges, swamp, etc.)
4. Observe and list animal foods in area:

Task B (30 minutes) Work in small groups.

Select three different habitats and compare the numbers of animal organisms and the characteristics in each.

Habitat I

Habitat II

Habitat III

Characteristics
of Habitat I

Characteristics
of Habitat II

Characteristics
of Habitat III

ENVIRONMENTAL HABITATS

Task C (15 minutes)

Build a food pyramid showing the comparative amounts of animal and animal evidences seen.

Task D (10 minutes)

List the animals you have seen or their evidences in the appropriate places in this diagram. Put in arrows. What other words and ways can you think of to illustrate a similar cycle?

Light
↓↓

Plants



Nutrients

Herbivores (plant eaters)



Decomposers
(bacteria-fungus)

Carnivores (meat eaters)



Death

What would happen if one group were eliminated?

If _____ group was eliminated, I think the following would happen: _____

ENVIRONMENTAL HABITATS

Task E (10 minutes)

Construct a 5-stage food chain using specific animals seen so far.

Task F (20 minutes)

Describe in writing, 3 influences that you observed that have changed the habitats in this area, and the cause and effect relationships that occurred.

Consider:

- a. Evidence of change, influence that made it.
- b. What area probably looked like before change occurred and animals that lived then.
- c. What area looks like now and animals that live here.
- d. How the change affected the habitat and animal species that did and do live there.

ENVIRONMENTAL HABITATS

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ENVIRONMENTAL HABITATS

Task G (10 minutes)

Describe how you feel about man's effect on one animal habitat you observed.

Task H (15 minutes)

Describe in writing 3 things you can do in your everyday life to make the energy cycle more efficient and cause the least amount of harm to the ecosystem.

Select the one you think would be your best contribution. Describe the benefits of this action--

- a. Where you live--
- b. In your consumer habitats--

Measuring Water Quality

TASK A: (15 minutes) Work in small groups.

Find _____ Creek on the map. Find your location.
Where does the water in this stream come from?
(trace upstream to its source)

Draw lines around the boundaries of our watershed. (We're in the _____ Creek watershed.)

TASK B: (10-15 minutes) Work by yourself or in small groups.

As you approach the stream, observe and record your observations about the stream environment: (can be done visually and verbally)

plants

animals

air

rocks

water

TASK C: (30-40 minutes) Work by yourself or in groups.

Using collecting equipment (screens, jelly cups, etc.) collect as many types of aquatic animals as possible.

Put them in the white dishpans for observation by the group. (Keep the pan in a cool place)

Contact the instructor when you're finished, to receive the next task.

TASK D: (20-30 minutes) Work by yourself or in groups.

Using the Golden Nature Guide Pond Life books and attached picture keys, generally identify the specimens you found.

List or sketch the animals you found below.

Description of where found	Type (name or sketch)	No.

Return animals to water as soon as finished.

Measuring Water Quality

TASK E: (15-20 minutes) Work by yourself.

Based on the aquatic animals you found, and the charts below in the Analyzing Data Section, predict the following characteristics of this stream:
I predict:

the water temperature will be _____ because _____
 the air temperature will be _____ because _____
 the pH number will be _____ because _____
 the dissolved O₂ count will be _____ because _____
 Keep these predictions for your own reference.

Analyzing Data

MOST ACID	pH RANGES THAT SUPPORT AQUATIC LIFE								MOST ALKALINE				
	NEUTRAL												
1	2	3	4	5	6	7	8	9	10	11	12	13	14

Bacteria 1,0	13,0
Plants (algae, rooted, etc.)	6,5 12,0
Carp, suckers, catfish, some insects	6,0 9,0
Bass, crappie	6,5 8,5
Snails, clams, mussels	7,0 9,0
Largest variety of animals (trout, mayfly, stonefly, caddisfly)	6,5 7,5

DISSOLVED OXYGEN REQUIREMENTS FOR NATIVE FISH AND OTHER AQUATIC LIFE

	D.O. in parts per million
Cold-Water Organisms including (salmon and trout)(below 68°)	
Spawning.....	7 ppm and above
Growth and well-being.....	6 ppm and above
Warm-Water Organisms (including game fish such as bass, crappie)(above 68°)	
Growth and well-being.....	5 ppm and above

TEMPERATURE RANGES (APPROXIMATE) REQUIRED FOR GROWTH OF CERTAIN ORGANISMS:

Temperature	Examples of Life	
Greater than 68°. (warm water)	Much plant life, many fish diseases. Most bass, crappie, bluegill, carp, catfish, caddis fly.	
Less than 68° (cold water)	Upper range (55-68)	Some plant life, some fish diseases. Salmon, trout, Stonefly, mayfly, caddis fly, water beetles, striders
	Lower range (Less than 55)	Trout, caddis fly, stonefly, mayfly

Measuring Water Quality

TASK F: (20-30 minutes) Work in groups of 4-6 people.
(This task could be taped somewhere on the water test kit.)

MAKE SURE EVERYONE IN YOUR GROUP GETS INVOLVED IN THE TESTING.
Using the water test kit, determine the water temperature, air temperature, dissolved oxygen count, and pH of the stream.
Record the data below: (also record predictions from Task E to compare)

Location of water sample (Edge or middle of stream)	Time Taken	Temperature				pH		Useable Oxygen (ppm)	
		Water	Air	My Pred.	Act. Test	My Pre.	Act. Test	My Predic.	Actual Test

TASK H: (10-15 minutes) Work by yourself.

1. Describe in writing how you feel about man's effect on the aquatic environment at this site:
2. Describe at least one action you can take in your everyday life to help improve the way water is managed:
 - a) in your home: _____
 - b) in your community: _____
 - c) in your consumer habits: _____
3. Describe the benefits of each action in #2.

Measuring Water Quality

TASK G: (45 minutes)

DETERMINATION OF STREAMFLOW

Instructions for collecting and recording streamflow measurements.

- a. Measure and mark a 100 foot distance along a straight section of your stream. If you can't find a 100' section, use 25' or 50'. Throw a stick (2 or 3 inches long) in the water above the upstream marker. Record the number of seconds it takes to float downstream between the markers. Record below. Now divide the 100 foot distance by the total seconds it took the stick to float between the stakes.

$$100 \text{ ft.} + \frac{\text{ft. per second}}{(\text{distance}) (\text{total seconds}) (\text{number of feet stick floated})}$$

to float 100 ft. (each second)

- b. Find the average width of your section of the stream. Measure the width of the stream at 3 places within the 100 foot area. Divide the total by 3 to get the average width of the stream.

First measurement _____ feet.

Second measurement _____ feet.

Third measurement _____ feet.

$$\text{Total } \frac{\text{feet}}{3} = \text{ ft. (average width)}$$

- c. Find the average depth of your section of the stream. Measure the depth of the stream in at least 3 places across the stream in a straight line. Divide the total by 3 to get the average depth of the stream.

First measurement _____ feet.

Second measurement _____ feet.

Third measurement _____ feet.

$$\text{Total } \frac{\text{feet}}{3} = \text{ ft. (average depth)}$$

- d. Find the cubic feet of water per second. Multiply the average width, average depth and the number of feet the stick floated each second.

$$\frac{\text{Average Width}}{\text{ft.}} \times \frac{\text{Average Depth}}{\text{ft.}} \times \frac{\text{Number of feet per second}}{\text{ft.}} = \frac{\text{Cubic feet of water flowing per second}}{\text{ft.}^3}$$

Note: A cubic foot of water is the water in a container 1 foot wide, 1 foot high and 1 foot long, and contains 7.48 gallons.

In order to find out how many people could live from the water in this stream, complete the following calculations.

$$\frac{\text{Stream flow in Cu. ft. per sec.}}{\text{Gallons in 1 cu. ft. of water}} \times \frac{7.48}{\text{Gallons in 1 cu. ft.}} = \frac{\text{Gallons of water flowing per second}}{\text{Per second}}$$

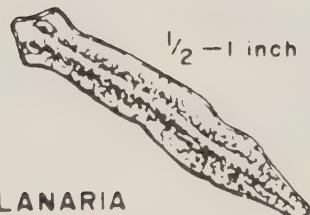
$$\frac{\text{Gallons per second}}{\text{Sec. in minute}} \times \frac{60}{\text{Sec. in minute}} = \frac{\text{Gallons of water}}{\text{per minute}}$$

$$\frac{\text{Gallons of water per min.}}{\text{No. minutes in a day}} \times \frac{1440}{\text{Total gallons water per day}} \times \frac{*200 \text{ Gals.}}{\text{Amount of water one person uses per day}} = \frac{\text{Total no. people who could live from water in this stream}}{\text{per day}}$$

*The average person uses about 200 gallons of water a day for home use. This does not reflect each persons share of water used for industrial, public services, and commercial.



SUB-SURFACE FRESH WATER ORGANISMS



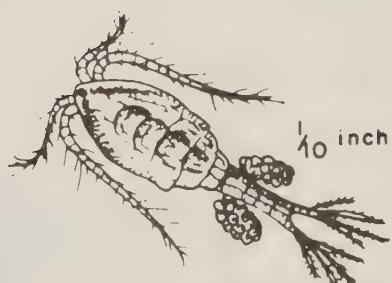
PLANARIA



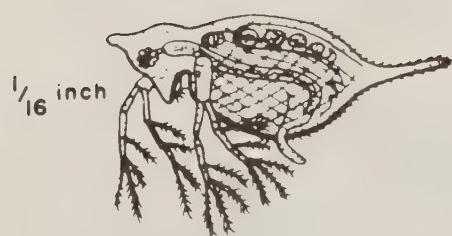
BRYOZOAN
COLONY



LEECH



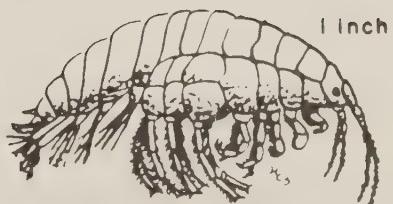
CYCLOPS



DAPHNIA



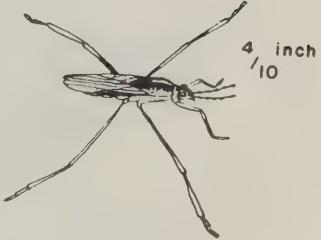
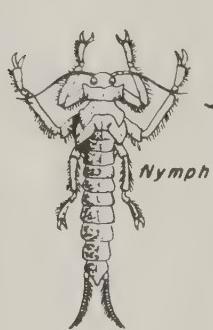
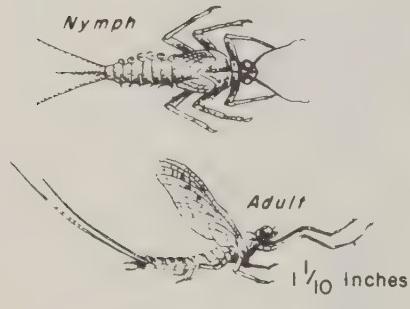
FAIRY SHRIMP 1 inch



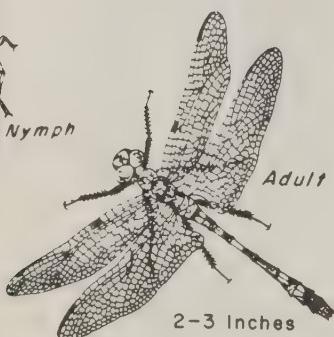
FRESH WATER
SHRIMP



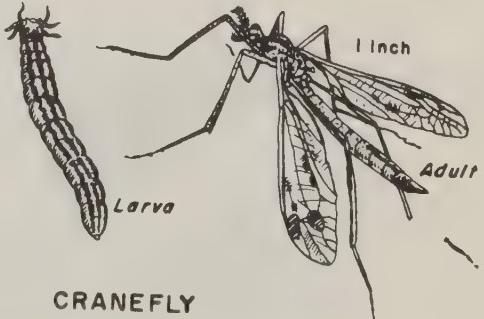
AQUATIC INSECTS



WATER STRIDER



STONEFLY



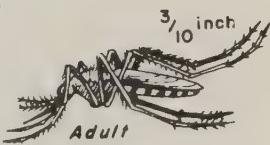
WHIRLIGIG BEETLE

CRANEFLY

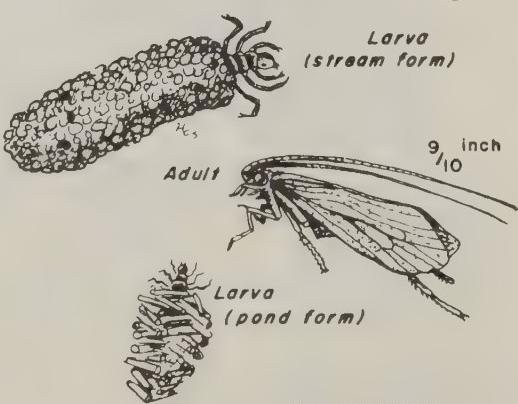
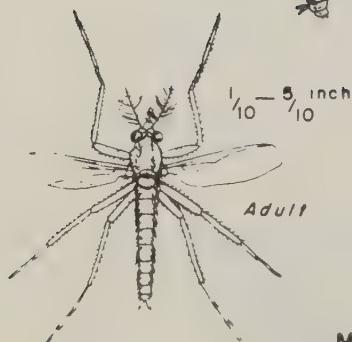
DRAGONFLY



BLACK FLY



MOSQUITO



CADDISFLY

Soil Investigations

TASK A: (5 minutes) work by yourself

Describe in writing your own description of soil.

Keep this description for your own reference at the end of the session.

TASK B: (15 min.) work in small groups

1. Predict what things you will find in the top few inches of this forest floor. List your predictions:

2. Stake out an area 2 or 3 feet square on the forest floor and sift through the top 3 inches of the soil, recording the evidence of plant and animals you observe.

Name or Description of Item in the Soil	Quantity	Possible Effect on Soil

3. The following three terms are used to describe organic matter at the top of the soil - litter, duff, humus. From your study above, complete the following chart:

Term and definition	Describe the feel	List the identifiable parts of plants and animals you found
(identifiable dead Litter things on surface)		
Duff (partially decomposed organic matter - compacted)		
Humus (almost completely decomposed non- identifiable organic matter)		

Soil Investigations

TASK C: (20-30 minutes) Work in small groups or by yourself

Using the skills you have just developed, and the available equipment, construct a soil micromonolith of this soil profile. Record your observations on the soil micromonolith lab sheet. You may want to make a micromonolith using the cards and jelly cups; if so, ask your instructor.

When finished with this task, report to the instructor to receive **TASK D.**

Air temperature 3 ft. above soil surface	
Air temperature just above soil surface	

Sketch your soil profile, label the layers or horizons and record the data.

DATA

PROFILE SKETCH

Contents of material above soil: _____, Depth ____" to ____".

A. (Horizon): Depth ____" to ____", Color ____
Topsoil Texture: Sand ___, Silt ___, Clay ___,
Structure: Columns ___, Blocky ___,
Platey ___, Granules ___. pH ___, Temp. ___,
____ F, Plant Roots Visible ____.

Record below the same information above
for the rest of the layers.

Describe type of rock in the bedrock (if present) _____

Soil Investigations

TASK D:

Work in small groups or by yourself.

Use the soil data you collected and the following tables answer the following questions:

Effect of Soil Depth on Plant Growth and Water Storage

Deep Soil (over 42")	Excellent water storage and plant growth
Mod. Deep Soil (20"-42")	Good water storage and plant growth
Shallow Soil (20" & under)	Poor water storage and plant growth

The potential of my soil for water storage and plant growth is:
excellent _____ good _____ poor _____

Why? _____

Some Relationship of Color to Soil Conditions

Top Soil Condition	Dark (dark grey, brown to black)	Moderately Dark (dark brown to yellow-brown)	Light (Pale brown, to yellow)
Amount of organic material	Excellent	Good	Low
Erosion factor	Low	Medium	High
Aeration	Excellent	Good	Low
Available Nitrogen	Excellent	Good	Low
Fertility	Excellent	Good	Low

Subsurface Soil Color (B Horizon)	Condition
Dull Grey (if in low rainfall soils)	Water-logged soils, poor aeration
Yellow, red-brown, black (if in forest soils)	Well drained soils
Mottled grey (if in humid soils)	Somewhat poorly to poorly drained soils

- a. What can you say about the following, based on the color of the top soil, or A horizon?

amount of organic material _____

erosion factor _____

fertility _____

- b. What can you say about the drainage in the B horizon, based on color?

TASK D - continued

Soil Investigations

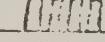
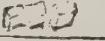
Texture	Effect of texture on - - -	
	Water holding capacity	Looseness of soil
Sand	Poor	Good
Silt	Good to excellent	Good
Clay	High (plants can't use it in clay)	Poor

My soil textureSoil water-holding capacityLooseness

Topsoil (A)

Subsoil (B)

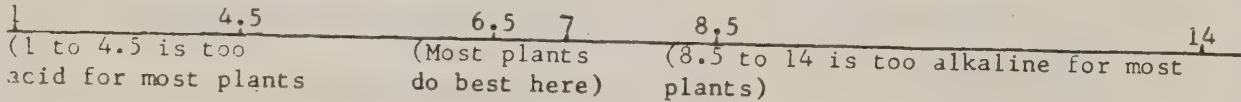
Effects of structure on soil conditions

Type	Penetration of water	Drainage	Aeration
Columns 	Good	Good vertical	Good
Blocky 	Good	Moderate	Moderate
Granular 	Good	Best	Best
Platey (low rainfall soils) (like stack of plates 	Moderate	Moderate	Moderate

Using the structures you recorded, and the chart, "Effects of Structure," what can you say about the drainage properties of your soil for:

Topsoil (A) _____

Subsoil (B) _____



Example of plants in pH range:

pH 4.0 - 5.0: rhododendrons, camellias, azaleas, blueberries, fern, spruce

pH 5.0 - 6.0: pines, firs, holly, daphne, spruce, oaks, birch, willow, rhododendron

pH 6.0 - 7.0: maple, mountain ash, pansy, asters, peaches, carrots, lettuce, pines, firs

pH 7.0 - 8.0: beech, mock orange, asparagus, sagebrush

Using the pH ranges you recorded and the table, "Examples of Plants in pH Range," complete the following chart:

Some Plants That Could Grow Here Based on the pH and Chart	Some Plants Actually Observed Growing Here
---	---

Soil Investigations

TASK D - continued

Did your inferences about the soil pH-plant relationships check out?

Yes No Explain: _____

Is pH the only factor affecting where plants grow? Yes No

Explain: _____

Describe in a short paragraph how you would set up an experiment to collect data and construct your own soil pH-plant relationship chart.

Soil temperature

Soil Temperature	Conditions during growing season
Less than 40° F	No growth, soil bacteria and fungi not very active
40° F to 65° F	Some growth
65° F to 70° F	Fastest growth
70° F to 85° F	Some growth
Above 85° F	No growth

The growing season for my area is _____

What does the soil temperature chart tell you? _____

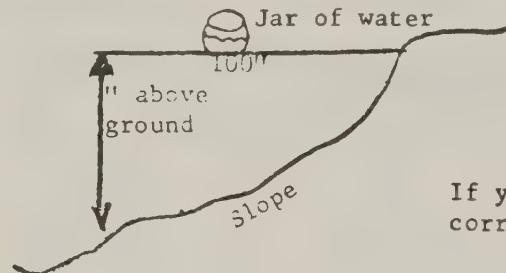
In the space below, convert the soil temperature table to a line graph.
(5-10 minutes) Work by yourself.

Soil Investigations

TASK E

Determining the Slope of the Land

1. Select a place that represents the average slope of the land being studied or take several measurements and average them.
2. Place one end of a 100" stick on the slope you want to measure. Hold outright to be about level.
3. Place a level or jar with some liquid in it on the outright stick. Raise or lower the stick until level.
4. Measure the number of inches the free end of the stick is off the ground.
5. The number of inches is the slope of the land in percent.



If you use a different length stick, then correct by using the conversion table below.

Conversion Table

Length Stick Used	No. inches the end of the stick is above the ground	Multiply by conversion factor	% Land
100"	_____	X 1	=
50"	_____	X 2	=
25"	_____	X 4	=

Soil Investigations

Land Use Chart

This is a chart for soils in one kind of land, climate and plants. Other areas may require a different set of criteria.

<u>Agriculture Uses</u>	<u>Slope</u>	<u>Erosion Hazard</u>	<u>Soil Depth</u>	<u>Drainage</u>	<u>Texture</u>
Farm crops-cultivation good soil mgmt. practices	0-3	None	Deep	Well drained	Loam or silt loam
Farm crops-few to several special cultivation practices	3-20	Slight to moderate	Mod. deep	Somewhat poorly	Sandy loam or silty clay
Occasional cultivation many special practices	20-30	Severe	Shallow	Poor	Sand or clay
Pasture-woodland culti- vation, no machinery can be used	0-2	None to slight	Deep	Well to poor	Stoney
Pasture, timber growing, woodland, wildlife, no cultivation machinery	30-90	Very severe	Deep to shallow	Well to poor	Sandy, silty, claying or rocky
Wildlife, recreation	all	None to extreme	Deep to shallow	Excessive to poor	Rockland, river wash, sand dunes

The most limiting soil factor will determine the best agricultural use of the land.

Occupancy land uses by man--

Man's valued uses of land has demanded criteria, in addition to agricultural uses, to determine proper management practices for living on the land. (Examples of others include: prescriptions for aesthetic management, soil site indexes for growing timber, criteria for greenbelts, etc.)

<u>Some Uses & Factors Affecting That Use</u>	<u>Slight Limitation</u>	<u>Moderate Limitation</u>	<u>Severe Limitation</u>
Roads and Streets			
Slopes	0-12%	12-30%	Over 30%
Depth	Over 40"	20-40"	Less than 20"
Watertable	Over 20"	10-20"	Less than 10"
Building Sites			
Slopes	0-12%	12-20%	Over 20%
Depth	Over 40"	20-40"	Less than 20"
Watertable	Over 30"	20-30"	Less than 20"
Septic Tank Filter Fields			
Slope	0-7%	7-12%	Over 12%
Depth	Over 6'	4-6'	Less than 4'
Watertable depth below trench	Over 4'	2-4'	Less than 2'

(Over)

Land Use Chart (Continued)

Picnic and Camp Areas

Slope	0-7%	7-15%	Over 15%
Stones	0-20%	20-50%	Over 50%
Watertable during season of use	Over 30"	20-30"	Less than 20"

Soil Investigations

TASK F: (20 minutes) Work in small groups

Using the data from Task D, Task E, and the land use chart, answer the following questions.

According to the agriculture and occupancy land use charts, this land could be used for:

Agriculture use:
(list & explain why)

Occupancy: (yes or no and with what limitations)

Roads and streets

Building sites

Septic tank filter fields

Picnic and camp areas

I feel the best uses of this land would be: (justify your answer)

Soil Investigations

TASK G: (10 minutes) Work by yourself.

Using the words from the data you collected and recorded on the soil micro-monolith card, write a description of the soil in your soil study. Compare this description with the one you wrote at the beginning of the session.

TASK H; (10 minutes)

Describe what you can do to improve the use of the soil: in your backyard.
in your community.

FOREST INVESTIGATIONS

TASK A: (5-10 minutes)

Work with 1 or 2 other people.

Write down some things you notice about the cross sections.

TASK B: (on cards) (10 minutes)

Work with 1 or 2 other people.

Select 3 observations about the cross sections from the group list.

List possible reasons for these observations.

List ways you could set up an investigation to find out more about your observations and inferences.

<u>Observation</u> (What You Noticed)	<u>Inferences</u> (Possible Reasons For This)	<u>Investigations</u> (How We Could Find Out)
1.		
2.		
3.		

FOREST INVESTIGATIONS

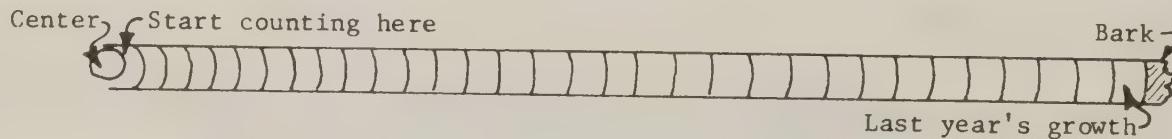
TASK C: (Part 1) (15-20 minutes) Work in groups of 4-5 people

1. Observe the tree core your group has been given and record the following information: (See drawing of tree core to help interpret the tree core you have been given.)

Tree #	# Dark Rings From Center to Bark (Approx. Age)	# Dark Rings in Last Inch	Remarks about the pattern of the rings

2. When your group has the above information, one person from the group should record this information on the blackboard or easel board. Chart to be like TASK C, part 2.

DRAWING OF TYPICAL TREE CORE



(Part 2) (10-15 minutes) Work in small groups

Record the following information about tree cores from the master chart.
(Instructor will provide the diameter information.)

Tree #	# Dark Rings From Center to Bark (Approx. Age)	Diameter of Tree Trunk (Cir. + 3)	# Dark Rings in Last Inch	Remarks about the Ring Pattern
1				
2				
3				
4				
5				
6				

FOREST INVESTIGATIONS

TASK C: (Part 3) (20-30 minutes) Work in small groups

Set up an investigation to find out reasons for some of the differences in the data.

1. Select 2-3 trees from the list that show differences in growth rates.
2. Which trees did you select? (Indicate by number) _____
3. Why did you select these trees? _____

Go with your group to the site of the trees you selected for investigation and do (Part 4)

(Part 4) (30-40 minutes) Work in small groups.

Collecting and Recording Data

Record your observations:

Interpreting Data

Record possible interpretations of the above data:

Summarizing your Investigation

Write your group's summary below, including:

- What you were trying to find out.
- What data you collected about it.
- What interpretations you made.
- What other data would you collect about your investigation?

FOREST INVESTIGATIONS

TASK D: (30-40 minutes)

Look for evidence of change (natural and man-made) in the environment.
Record and fill out other columns.

Evidence of Changes in the Environment	What Might Have Caused Them?	Effect on the Environment

Describe the way the area around you looked:

25 years ago

Describe how you think the area around you might look:

25 years from now

TASK E: (10 minutes)

Describe in writing how you feel about the changes in this environment.

FOREST INVESTIGATIONS

TASK F: (15-20 minutes) Work in groups or by yourself.

NOTE: DO NOT TEAR THE STUMP APART! Discuss why.

What things are changing the rotten stump now? Record below:

*Living things	Effect on Stump
*Non-Living things	Effect on Stump

TASK G: (15 minutes) Work in groups.

Construct a diagram of one of the cycles taking place in the rotten log or stump.

FOREST INVESTIGATIONS

TASK H: (30 minutes)

Describe in writing an alternative activity you could have done to establish a time sequence for the past events in this environment.

Describe in writing an activity you could do in a city environment to establish a time sequence for the past events in the environment.

Activity

What it would tell you about the
past events in the area

Describe an activity you could do in the area around your school to establish a time sequence for the past events in the area.

Activity

What it would tell you about the
past events in the area

Urban Investigations

TASK A: (20 minutes) Work in groups of 5-6.

List some things that might affect the quality of the environment in this community. (Use map and past knowledge of area.) Group and label items into categories.

TASK B: (60 minutes)

Develop a plan of action to investigate your part of the urban environment. Consider such things as how to divide responsibility for collecting information, what information to collect, will you stay together or split up, most efficient ways to collect and record information, develop tools to record information.

Urban Investigations

TASK C: (3-4 hours) Field investigation.

Each group spend 3-4 hours to do a visual survey and investigation of that portion of the community decided upon, using the methods of collecting, recording and interpreting data each group developed.

TASK D: (5 minutes, each group) After return from field investigation.

Plan a 5-minute report that tells and shows the methods you used and the information collected in TASK C. The report must use the following criteria:

- a. Use more than one person as spokesman.
- b. Use visual displays.
- c. Include a variety of information media and methods of getting it.
- d. 5-minute time limit.
- e. Consider--what you did, how you did it, what it meant.

Urban Investigations

TASK E: (30 minutes) Work in original small groups.

Select one interrelationship or problem that you identified and develop an in-depth investigation to find out more about it. Consider: What you need to find out about it, actual samples of how to collect and record information, cause-effect relationship, alternative solutions to the problem, where to collect additional data, what social and political decision-making processes are available.

Urban Investigations

TASK F: (15 minutes) Small groups.

List what you can say about your study area in relation to its: (consider past, present, future)

Functions

Problems

Needs

TASK G:

Describe what you would do to solve or improve the problem you identified in TASK E--

as a member of a community action group--

as a part of the political decision-making process in your community.

Urban Investigations

TASK _____

Develop in writing an investigation about some part of the man-made environment.

- a. Describe procedures in action or process terms.
- b. State objectives in behavioral outcomes that indicate some minimal expectations in acquiring new knowledge and skills.

Examples:

Correlation of observable weather conditions to air pollution index.

Correlation of man-made sounds to noise pollution.

Effect of signs and billboards on sight pollution.

Effect of architecture on aesthetics.

Impact of local shopping center on community.

Supermarket Survey (packaging, buying habits).

Interpreting the man-made landscape using architectural styles, etc.

(

)

10

COMPARING ENVIRONMENTS

TASK A: (15 minutes) Work in small groups.

Analyze the data collected for each environment and do the following:

1. List four things you found out about _____ environment.

1.

2.

3.

4.

2. List four things you found out about _____ environment.

1.

2.

3.

4.

COMPARING ENVIRONMENTS

TASK B: (15 minutes) Small groups.

List at least four basic functions of each environment.

_____ Environment _____ Environment

- 1.
- 2.
- 3.
- 4.

TASK C: (15 minutes) Small groups.

List three factors that affect the quality of the two environments.

_____ Environment _____ Environment

- 1.
- 2.
- 3.
- 1.
- 2.
- 3.

COMPARING ENVIRONMENTS

TASK D: (15 minutes) Small groups.

List at least four of the most obvious problems of the two environments.

Environment _____ Environment

TASK E: (20 minutes)

List at least four guidelines that you would use in planning for future land uses in both environments:

1. _____ environment

2. environment



Simulation Game

TASK A: (10 minutes) Work by yourself.

Read the background information for Centerplace City, and then list some possible uses of the vacant farmland.

"One square mile of unused county farmland, four miles northeast of the city is now available for the city's use."

Background Information Sheet: Centerplace City

The population is 250,000 and rapidly increasing.

The city's boundaries are being extended, but the suburban fringe is expanding even more rapidly.

The rapid population growth is accompanied by demands for more housing, more jobs, additional city services, and recreational areas.

The power for industrial uses, adequate public transportation, and a skilled labor force are available.

The city is located near forests, which are to the north.

The land to the east is devoted mainly to farming.

The Pipe River is unpolluted and is the source of irrigation water as well as the municipal water supply.

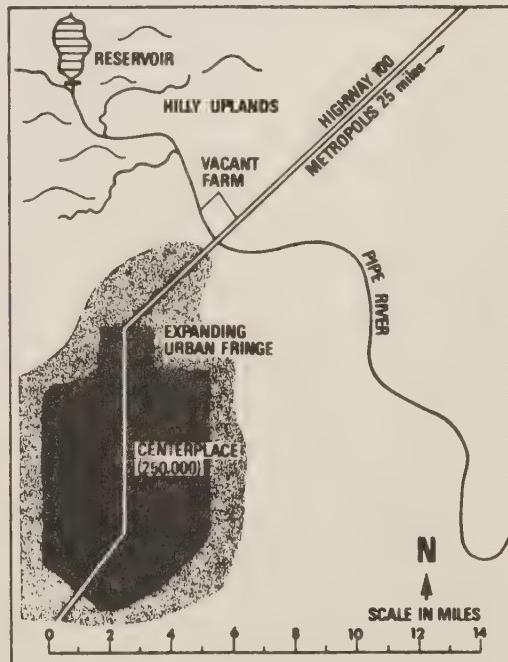
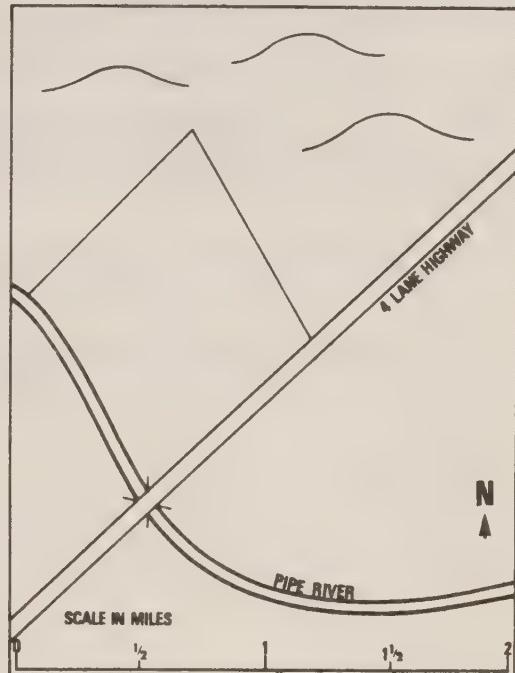
The river is too small for freight transportation, but logs could be floated on it.

The gravel bed of the river is appropriate raw material for concrete manufacture.

The present sewage treatment plant and garbage disposal area are at maximum capacity. The citizens of Centerplace are concerned about the maintenance of a scenic regional environment.

The County Board of Control is the authority for land zoning, and many citizens' groups are developing to influence zoning decisions.

List possible uses of the land below:



Simulation Game

TASK B: (10 Minutes) Group # _____ Assigned Category of Land Use _____

Your task is to analyze and list possible consequences of different land uses within your assigned land use category.

Use	Advantages to land/people	Disadvantages to land/people

Simulation Game

TASK C:

Develop a strategy and method to present your plan of development to the County Board of Control or appropriate local authorities.

- a. This presentation will be a proposal for developing the undeveloped farmland.
 - b. You must have a visual display such as a land use map drawing as a part of your presentation.
 - c. More than one person in your group must help in making the presentation.
-

Simulation Game

BOARD OF CONTROL

TASK C₁:

In the next 10 minutes you are to:

1. Select a chairman to call on the groups and to chair the board meeting.
(At outset, chairman will appoint a timekeeper to give a 2-minute warning and cut each presentation off at 3 minutes.)
2. Develop the criteria you will use in evaluating the proposals based on the needs of the people and characteristics of the land.
3. Develop some kind of table (example below) you can use in recording your evaluation of the presentations while they are being given.

Presentation	Criteria		

Simulation Game

TASK D (30 minutes)

DEVELOPING A SIMULATION GAME

Work with 1 or 2 other people.

Using a newspaper article about a local environmental land use problem, develop the format of a simulation game, considering the following items:

Identify the problem or issue to be decided upon.

Identify the choices available to the decision-makers.

Identify the factors having an influence on the decision.

(Continued)

Simulation Game

Identify individual or group roles.

Identify the factors (for or against) assigned to each role.

Establish conditions for the players (i.e., resources, voting procedures, bargaining money, etc.)

Develop specific goals or objectives for the players.

Include limits or rules for what is permissible behavior (time factor, trading, no. points, money allocations, etc.).

COMMERCIAL GAMES

There are many commercial environmental simulation games that are similar to monopoly, etc. Some of these, with approximate prices, are:

Dirty Water	\$10.00		
Smog	\$10.00		
Ecology	\$10.00		
Population	\$10.00	Urban Systems	\$10.00 each
		1033 Massachusetts Ave.	
		Cambridge, Mass. 02138	
Pollution	\$12.00		
The Redwood Controversy	\$10.00		
The Planet Mgt. Game	\$16.00	Houghton, Mifflin Co.	
		110 Fremont Street	
		Dept. M	
		Boston, Mass. 02107	
New Town	\$16.00 for 10 student kit		
	Harwell Assoc.		
	Box 95		
	Convent Station		
	New Jersey 07961		

Make Your Own Environment--Coca Cola
(Free to School Instructional Media Centers)



LEAF CLASSIFICATION

Task D

Describe other parts of trees we can classify, list curricular areas in which that part of the tree could be used, and describe in what ways.

<u>PART OF TREE</u>	<u>CURRICULAR AREA USED</u> (art, math, S.S., Sc. etc.)	<u>HOW USED</u>
eg. Bark	art	Construct mosaic. Classify different textures, compare texture, patterns and designs of different kinds of bark

LEAF CLASSIFICATION

Task E

Describe the values of classifying things in the environment.

LEAF CLASSIFICATION

Task F

Mark the processes used in this activity and give an example of how they were used. (Discuss in small group)

<u>Process</u>	<u>Example of How Used</u>
observing	
classifying	
measuring	
predicting	
inferring	
communicating	
formulating hypothesis	
experimenting	
interpreting data	

Observing Using all of the senses: hearing, seeing, tasting, smelling, and feeling.

Classifying Identifying objects or ideas and classifying them into groups according to similarities and differences. Students are encouraged to invent their own systems.

Measuring Using both standard units of measurements or invented units, students should have experience in measuring quantities (length, weight, volume, time, temperature, etc.)

Predicting Many students guess with little difficulty. Predicting, however, requires a higher level of thinking. Predictions are also based on some known data or evidence. Simple graphs and charts are helpful for students to use as a basis for prediction.

Inferring The ability to infer is basic to the formulation of hypotheses. Students can learn to infer when they can distinguish between an observation itself and an inference about an observation.

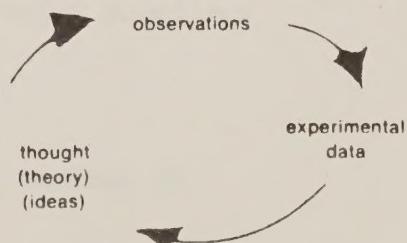
Communicating Clear and precise communication is essential in science. There should be many opportunities to communicate orally, with graphs, with pictures, and, when able, in their writings.

Other processes are more complex and are dependent on the foregoing processes.

Formulating Hypotheses Answers to many inquiries are simple. Many questions may be answered by asking an authority or by referring to the proper book or reference material. Answers to other inquiries require much further scrutiny. The student's initial general observations and informal manipulations may result in an attempt to investigate further or to experiment. A hypothesis based on his preliminary experience and his inferences is necessary to establish the direction of his efforts. Formulating intelligent hypotheses takes practice.

Experimenting Experimenting, as opposed to verifying, indicates a quest for an understanding of an uncertain phenomenon or an answer to an unsolved problem. The organization of this task is usually complex and takes many forms. One important aspect of such activity is the setting up of controls with which experimental results may be compared.

Interpreting Data Through observation and measurement, students will collect data. Can they organize and interpret these findings? True inquiry may begin with theory, observations, or experimental data, but the logical investigator always goes "full circle" regardless of his starting point.



This list was taken from "Science in Oregon Schools," Oregon State Department of Education, and was adapted from materials developed by the American Association for the Advancement of Science for the project AAAS Commission on Science Education.

Finally, with "functional" vocabulary, you can do more than just communicate with the people around you; you can also make things happen.

What Is Functional Vocabulary?

Functional vocabulary refers to words that are used in everyday situations. You probably already know what functional vocabulary is because you use it every day. Functional vocabulary includes words that you use to communicate with your family, friends, coworkers, and teachers. It includes words that you use to buy things at the store or to go to school. Functional vocabulary is important because it helps you to get along with other people. It also helps you to succeed in school and in your career. Functional vocabulary is a type of vocabulary that you can use right away.



Functional vocabulary is important because it can help you succeed in school and in your career. Functional vocabulary is also important because it can help you to communicate with other people. Functional vocabulary is a type of vocabulary that you can use right away.

Functional vocabulary is used in many different situations, such as:

• Small purchases you make at the grocery store
• Talking to your friends about what you did over the weekend
• Communicating with your teacher about what you learned in class

Functional vocabulary is often used in everyday situations, such as:

• Asking for directions when you're lost
• Buying groceries at the supermarket
• Talking to your coworkers about what you did over the weekend
• Communicating with your boss about what you learned in class

Functional vocabulary is also used in school, such as:

• Asking for help when you don't understand something
• Talking to your teacher about what you learned in class

Functional vocabulary is also used in the workplace, such as:

• Asking for help when you don't understand something
• Talking to your supervisor about what you learned in class

U. S. Forest Service
Southern Region
10/1/74

SOURCES,
SPECIAL EQUIPMENT FOR
ENVIRONMENTAL INVESTIGATIONS

This basic list reflects the best available information at the time it was compiled. Prices are approximate and subject to change. Listed items are obtainable from sources other than those shown.

Quantities listed are recommended for a group of about 15. However, more users per item may be accommodated.

<u>Quantity</u>	<u>Item and Catalog No.</u>	<u>Source</u>	<u>Approx. Cost (ea)</u>
5	Soil pH kit (ST-1001-T) 77032	--LaMotte Chemical Products --Forestry Suppliers	\$ 2.50 \$ 2.25
4	Water Test Kit (For O ₂ CO ₂ pH Model CA-10) 1438-00	--Hach Chemical Co.	\$38.00
1	*Increment borer (12 in. bore) 104012 63160	--Ben Meadows Co. --Forestry Suppliers	\$42.00 \$39.00
4	5' or 6' sewing tape	--Variety Store	\$.50
8	Magnifier (10X, folding) 103062 61492	--Ben Meadows --Forestry Suppliers	\$ 1.25 \$ 1.90
2	Measuring tape (100', non- metallic) 121904	--Ben Meadows Co.	\$16.00
4	**Water Thermometer (pocket, w/case) 89032	--Forestry Suppliers	\$ 5.50
8	Pond Life booklet (Golden Nature Guide)	--Variety or Book Store	\$ 1.50

<u>Quantity</u>	<u>Item and Catalog No.</u>	<u>Source</u>	<u>Approx. Cost (ea)</u>
4	**Soil thermometer (Dial head, bi-metallic) 221595 8906	--Ben Meadows Co. --Forestry Suppliers	\$14.00 \$12.00
	(or (Pocket dial, w/case) 221588 89092	--Ben Meadows Co. --Forestry Suppliers	\$10.00 \$10.00
	Portion cup, with lid (45 for soil inves; 15 for water inves.)	--Unijax, Inc.	Cups are 1-1/2 oz. (#250), \$30.00 for case of 2,000; lids (N64-1) are \$4.00 for case of 1,000.

*Borer is used in preparation for Forest investigation.

**Suitable thermometers can be purchased from scientific supply co's.
A minimum order is usually required.

SOURCE ADDRESSES

Hach Chemical Co.
P. O. Box 907
Ames, Iowa 50010

Forestry Suppliers, Inc.
P. O. Box 8397
Jackson, Miss. 39204

Ben Meadows Co.
P. O. Box 8377, Station F
Atlanta, Ga. 30306

Unijax, Inc.
P. O. Box 20177
Atlanta, Georgia 30325

LaMotte Chemical Products Co.
Chestertown, Md. 21620